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# THE ROLE OF SOCIAL AND DISPOSITIONAL VARIABLES ASSOCIATED WITH EMOTIONAL PROCESSING IN ADJUSTMENT TO BREAST CANCER

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ABSTRACT OF THESIS

# THE ROLE OF SOCIAL AND DISPOSITIONAL VARIABLES ASSOCIATED WITH EMOTIONAL PROCESSING IN ADJUSTMENT TO BREAST CANCER

Recent theories suggest that cognitive and emotional processing is critical to successful adjustment to traumatic experiences, such as breast cancer. Cognitive and emotional processing of trauma can be facilitated by both dispositional (e.g., emotional intelligence) and situational (e.g., social supports, social constraints) factors. The present study investigated the relationship between emotional intelligence and current social support and constraints in a sample of 190 breast cancer survivors (mean age=48.3 years; SD=8.9). Women were recruited via postings to on-line breast cancer support groups. Postings to support groups described the study, and provided a link to the study web site. The study consisted of eight web pages, each containing a separate questionnaire. Study questionnaires included a demographic/clinical screening, and self-report measures of social support, social constraints, intrusive ideation and avoidance, anxiety, depression, and emotional intelligence. Multiple regression analyses indicated that high social constraints and low emotional intelligence were associated with high psychological distress, while there was no significant association with social support. In conclusion, study results support the social-cognitive processing model. The inclusion of emotional intelligence may further broaden this model, and foster additional research. Results also demonstrate that Internet-based data collection is a useful research method.

John E. Schmidt

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THESIS

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The Graduate School

University of Kentucky

2002

# THE ROLE OF SOCIAL AND DISPOSITIONAL VARIABLES ASSOCIATED WITH EMOTIONAL PROCESSING IN ADJUSTMENT TO BREAST CANCER

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THESIS

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A thesis submitted in partial fulfillment
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By

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# Introduction

## Background

The experience of being diagnosed with a life-threatening illness can constitute one of the most stressful and traumatic events an individual may have to face. The potential negative psychosocial impact of such an experience is well documented in the literature and can include anxiety, depression, reduced quality of life, impaired social support, and the experience of symptoms similar to those of posttraumatic stress disorder (PTSD) (Moyer & Salovey, 1996). Specific research has reported significant levels of anxiety and depression in breast cancer survivors (Morris, Greer, & White, 1977), individuals with Hodgkin's disease (Kornblith, Anderson, Cella, Tross, Zuckerman, Cherin, Hernderson, Weiss, Cooper, & Silver, 1992), leukemia (Greenberg, Kornblith, & Holland, 1997; Lesko, Ostroff, Mumma, Mashberg, & Holland, 1992), and heterogeneous groups of cancer survivors (Greaves-Otte, Greaves, Kruyt, van Leeuwen, van der Wouden, & van der Does, 1991).

When initially diagnosed, the cancer patient is confronted with a significant life-changing event, and his or her own mortality. Additionally, the diagnosis may bring fears associated with pain and the possibility of disfigurement. If the patient is to undergo radiation or chemotherapy, they may also have fears of recurrence. Along with the overwhelming medical challenge, cancer patients also may face a drastic change in their life-roles. A patient who was the main source of financial or emotional support for his or her family may suddenly become the one who needs support all the time. Careers and life goals may come to a standstill, as the individual wages a battle with the disease that has taken over his or her life. Given the impact that a diagnosis of cancer can have on the patient, it is no wonder that they may experience high levels of distress. In general, a diagnosis of cancer has a major negative impact, at least in the short term, on the quality of life of the patient (Andersen, 1992). It also has been reported that many cancer patients may meet the criteria for a psychiatric diagnosis at some time following their cancer diagnosis (Spiegel, 1996).

There has been much recent research regarding the psychological consequences of being diagnosed with, and undergoing treatment for breast cancer (Classen, Koopman, Angell, & Spiegel, 1996; Epping-Jordan, Compas, Osowiecki, Oppedisano, Gerhardt, Primo, & Krag, 1999; Glinder & Compas, 1999; McKenna, Zevon, Corn, & Rounds, 1999). A diagnosis of

breast cancer brings fears similar to those of other cancer patients, although there are some issues that may cause the breast-cancer patient additional distress. Women who are diagnosed with breast cancer may especially fear disfigurement, loss of functioning, fears of abandonment, and death. Initial reaction after diagnosis may include depression, anxiety, and feelings of social isolation.

Factors Associated With Psychological Adjustment In Cancer Patients

Given the risk for distress in cancer patients in general, and breast cancer patients in particular, it is critical to identify factors associated with risk of distress. Research and theory suggest three distinct groups of variables may be associated with level of distress in women with breast cancer: (a) demographic variables such as age and education level, (b) clinical variables such as stage of disease and type of surgery, and (c) psychosocial variables such as social support, and previous stressful or traumatic events (Rowland & Massie, 1998).

Demographic factors.

Age of the patient appears to be associated with long-term psychological adjustment to the trauma associated with breast cancer. Specifically, older women that have had a total mastectomy have reported better psychological adjustment than younger women who have undergone a total mastectomy, while for partial mastectomy the opposite results were found with younger women being better psychologically adjusted (Dorval, Maunsell, Deschenes, & Brisson, 1998; Jacobsen, Widows, & Hann, 1998). Younger women may also have more difficulties due to the disruption as primary caretaker of children, or loss of additional income during treatment (Mor, Malin, & Allen, 1994). Additionally, higher education level was found to be associated with more avoidant coping and intrusive thoughts at both diagnosis and at six months post-diagnosis (Epping-Jordan et al., 1999).

Clinical factors.

Women who are diagnosed early and have a positive outlook may have a reduced perception of threat than women diagnosed with stage III or stage IV breast cancer (Green, Rowland, Krupnick, Epstein, Stockton, Stern, Spertus, & Steakley, 1998). Stage of disease may also have an impact on perceived fear of recurrence, which was found to range from 42% to 89% in breast cancer survivors (Polinsky 1994, Sneeuw, Aaronson, & Yarnold 1992; Meyer, & Aspeegren, 1989). Additionally, breast cancer survivors who were treated with chemotherapy

were found to have significantly greater fears of recurrence than those who had not been treated with chemotherapy (Lasry, Margolese, & Poisson, 1987; Schover, Yetman, & Tuason, 1995), although this statistic may be misleading as one reason for receiving chemotherapy is higher risk of recurrence.

Current medical treatment modalities include the option of mastectomy or breast conserving lumpectomy. Mastectomy entails surgical removal of the breast to varying degrees depending on the extent of the carcinoma (Kennedy, 1989). In a 1991 review of the impact of breast conserving treatments versus mastectomy on quality of life, Kiebert, de Haes, & van de Velde found mastectomy patients to have poorer body image and more problems with sexual functioning (Kiebert, de Haes, & van de Velde, 1991). Women who have had breast-conserving surgery have been shown to be better adjusted psychologically, have better marital functioning, and have better body image than women receiving mastectomies (Moyer, 1997; Levy, Haynes, Herberman, Lee, McFeeley, & Kirkwood 1992; Kiebert et al., 1991). In a more recent study, women who underwent breast-conserving surgery showed better psychological adjustment six months after treatment than mastectomy patients, but showed worse psychological adjustment 40 months post-treatment (Cohen, Hack, de Moor, Katz, & Gross, 2000). Cohen et al speculated that this surprising result might be due to the additional treatment required by breast conserving surgery (i.e. radiation, chemotherapy), or that breast conserving surgery patients may feel more anxiety over time regarding possible recurrence as they still have an intact breast (Cohen et al., 2000).

Psychosocial factors.

Psychosocial variables that have been shown to help predict adjustment include history of pre-cancer trauma or stressors (Andrykowski & Cordova, 1998, Green et al., 2000) and pre-cancer history of depression (Maunsell, Brisson, & Deschenes, 1992). A strong sense of global meaning, defined as the belief that one's life has purpose and order, was shown to be associated with less psychological distress (Johnson-Vickberg, Bovbjerg, DuHamel, Currie, & Redd, 2000). High levels of optimism at time of diagnosis have also been shown to indicate less psychological distress (Epping-Jordan et al., 1999; Carver, Pozo, Harris, Noriega, Scheier, Robinson, Ketcham, Moffat, & Clark, 1993).

Having a good social support system can also contribute to better adjustment, and may consist of instrumental aid in the form of financial assistance or physical help such as assistance

with household chores. Social support may also include emotional aid through listening and caring, and informational aid such as providing education on post-surgical care (Schaefer, Coyne, & Lazarus, 1981). Several studies have shown that strong affective social support is related to good emotional adjustment (Zemore & Shepel, 1989; Dunkel-Schetter, 1984).

Generally, there are numerous reasons why women have different levels of adjustment to the diagnosis and treatment of breast cancer. The majority of research in this area, as discussed above, has concentrated on events or experiences that are external to the individual and center around fundamental factors of medical treatment (type of surgery, stage of illness, age of patient, etc.). Understanding individual differences in adjustment to breast cancer and other traumatic experiences is an important clinical problem, and there is a growing orientation towards studying social, cognitive, and dispositional factors in adjustment.

Cognitive Processing and Trauma Adjustment

The research discussed so far indicates that cancer can be a traumatic experience. The diagnosis and subsequent treatment of cancer can produce distress in the form of anxiety and depression, difficult social adjustment, and the threat of disfigurement. Recent theories of trauma adjustment suggest that cognitive and emotional processing are critical to recovery from the distress associated with traumatic experience (Creamer, Burgess, & Pattison, 1992; Greenburg, 1995). A cognitive processing model of post trauma reactions assumes that the individual possesses a mental schema or framework through which current events are interpreted (Janoff-Bulman, 1992). An individual's schema may be thought of as a fundamental belief system based on their past experiences and is the foundation with which assumptions and expectancies are formed with regard to future events (Hollon & Kriss, 1984). When the individual experiences a traumatic event, it essentially challenges schemas that may exist pertaining to safety and invulnerability. The underlying schemas must be modified after the traumatic experience if the individual is to recover psychologically (Horowitz, 1986). According to the cognitive processing model proposed by Creamer et al. (1992), the individual's adjustment to trauma is a multi-step process that includes trauma exposure, network formation, intrusive thoughts, avoidant behavior, and network resolution. Network formation, following exposure to a traumatic stressor, represents the development of a memory network. In order for the individual to begin recovery from the distress associated with traumatic experience, this memory

network must be activated and modified. During the course of recovery, most individuals experience intrusive thoughts and avoidant behavior, as they work towards resolving the distress. The process of modifying the network is termed network resolution, and can be achieved through more productive means of exposure to the traumatic memories than intrusive thoughts or avoidance. One such method is talking about the traumatic experience with family and friends or being emotionally expressive with one's thoughts and feelings regarding the traumatic event (Creamer et al., 1992).

The individual's ability to be emotionally expressive has been shown to enhance recovery to both medical (Gross, 1989) and non-medical trauma experiences (Lepore, Silver, Wortman, & Wayment, 1996). Recent work addressing emotional expression and adjustment to cancer suggests that coping through actively processing and expressing emotion leads to better psychological adjustment, and may even be critical to successful trauma adjustment (Stanton, Danoff-Burg, Cameron, Bishop, Collins, Kirk, & Sworowski, 2000; Servaes, Vingerhoets, Vreugdenhil, Keuning, & Broekhuihsen, 1999). Breast cancer patients who have been shown to be more ambivalent towards expressing emotions are more repressive of aggressive feelings, more reserved, and more anxious than healthy controls (Servaes et al., 1999), while patients who use emotional expression as a coping mechanism exhibit decreased distress, higher energy levels, reduced use of medical caretakers (Stanton et al., 2000), report less mood disturbance, and have more fighting spirit (Classen et al., 1996). Stanton et al. (2000) also tested other coping strategies such as avoidant-oriented coping, spiritual coping, and acceptance, but found that those individuals who utilized emotional expression as their main coping mechanism fared better over time with both psychological and physical adjustment. Women in this study who used an emotionally expressive approach to coping also perceived a more receptive social environment, which may indicate less social constraints for these individuals (Stanton et al., 2000).

The cognitive processing model to trauma adjustment has been further enhanced by the consideration of the social environment of the individual (Lepore et al., 1996). In addition to the cognitive processing of trauma related information, the sharing of thoughts, feelings, and meanings of this information with others who are supportive is crucial for successful psychological adjustment to trauma (Lepore et al., 1996). Lepore's social support reactivity theory (Lepore, 1998) proposes that emotional distress may remain at an elevated level if the

individual does not engage in discussion of trauma. This discussion by necessity occurs in a social or interpersonal context and includes disclosure and discussion of trauma-related emotion.

The lack of emotional disclosure and discussion of trauma may stem from social constraints. Social constraint can be described as the hindrance of an individual's expression of trauma related thoughts, feelings, or concerns due to negative responses from others (Tait & Silver, 1989). An individual may experience social constraints in a number of ways. The person's support system may consist of others who say or do things that are inappropriate or insensitive such as giving "canned" responses. Additionally, individuals may not discuss their thoughts and feelings regarding the trauma because of negative reactions from others. Thus, the breast cancer patient's confidence that she can discuss feelings and concerns is a very important type of support and may indicate that the more understanding, love, and acceptance one receives from another individual, the more one is able to confide in that individual (Zemore & Shepel, 1989). Taylor, Lichtman, & Wood found that the breast cancer patient's belief that she could share her concerns with her significant other and her perceived sense of support from friends and family was correlated with psychological adjustment (Taylor, Lichtman, & Wood, 1983). A possible consequence of social constraints may be an interference with cognitive and emotional processing of trauma due in part to inhibition of emotional disclosure about the trauma. The net result of inhibition of emotional disclosure may well be prolonged psychological distress (Lepore et al., 1996).

In addition to those suggested by a social-cognitive-processing model of adjustment to stressful events, it would be useful to identify other theoretical variables that would allow better understanding of adjustment. By and large, the social-cognitive processing model addresses situational and environmental indicators that are generally external to the individual in nature. That is, in order for the individual to actively engage in processing trauma, they must have interaction with other individuals and it has been shown that social support and emotional expression help in this context, while social constraints limit the benefit. In addition to these social-situational variables, it is possible that there are also dispositional variables or innate characteristics that may facilitate or inhibit emotional and cognitive processing of trauma, and hence impact trauma recovery.

Dispositional Characteristics Potentially Relevant To Emotional Processing Of Trauma

Given that the social-cognitive processing theory posits that emotional disclosure and processing of trauma is critical to adjustment, it is important to consider variables associated with emotional expression and disclosure. In addition to the social environment (discussed above), dispositional characteristics may play a critical role. One characteristic that may be relevant is emotional intelligence.

Emotional intelligence may be related to emotional disclosure tendencies and thus potential adaptation to trauma (Mayer & Salovey, 1993). Emotional intelligence (EI) is defined as "the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth" (Mayer & Salovey, 1997). Additionally, people who are higher in EI may be more able to regulate affect within themselves and within others, which will improve their overall quality of life (Mayer & Salovey, 1993). Further, Mayer & Geher (1996) found that individuals who were better at connecting their own feelings and thoughts were better at identifying the emotional implication of their thoughts on those around them. Specifically, those individuals who displayed more EI characteristics also scored higher on a scale of empathy (Mayer & Geher, 1996) and more empathic individuals were better able to extract emotional information from faces, colors, and abstract designs (Mayer, DiPaolo, & Salovey, 1990). When presented with a stressful event, such as viewing graphic footage from a trauma center, individuals who were more emotionally intelligent were more attentive to their moods, had a better sense of clarity towards their moods, and were better able to actively repair their mood states (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Because of their ability to recognize and manage their own emotions, individuals higher in EI should have more success in cognitive and emotional processing of distressing experiences, such as breast cancer, and thus evidence better psychological adjustment.

The Internet In Psychological Research

A small, but growing number of researchers are using the Internet as a research tool. The first known web experiment investigated psycho-acoustical auditory perception (Welch & Krantz, 1996), although this and other similar studies are not considered full web-based

experiments since the subjects had to follow the web instructions with a printed tutorial while sitting at the computer (Weigend, 1995, Welch & Krantz, 1996). The first true web experiment, and the first published in a scientific journal, investigated the determinants of female attractiveness (Krantz, Ballard, & Scher, 1997). This study is particularly interesting because the authors conducted two identical experiments; one in the laboratory and one on the Internet in an attempt to establish the validity of the Internet as research medium. There were minimal differences between the laboratory data set and the Internet data set in this study. In fact, differences that did exist may have been due to the minor modifications needed to present visual stimuli on a computer screen than to any fundamental differences between these two research settings (Krantz et al., 1997).

Since this initial groundbreaking study, there have been many other web-based studies investigating a variety of topics including judgment and decision making (Birnbaum, 1999), panic attacks (Stones & Perry, 1998), and logical thinking (Musch & Reips, 2000). The majority of Internet experiments to date have been cognitive in nature, but there are some researchers in other areas of psychology that have tested this alternative approach to data collection. Specifically, Buchanan & Smith (1999) conducted a personality assessment on the Internet concurrently with one in their laboratory using Gangestad & Snyder's (1985) Self-Monitoring-Scale-Revised (SMS-R). This scale is a measure of the tendency to observe and regulate expressive behaviors and self-presentation. High self-monitors are more sensitive to social and situational cues and adjust their behavior accordingly, while low self-monitors tend to behave in ways consistent with their stable personality attributes (Snyder & Gangestad, 1986). The experiment was run over a period of 14 weeks and they obtained 963 valid records from their web page. The traditional sample consisted of 224 undergraduate college students. Coefficient alpha for the web sample was 0.75, and 0.73 for the traditional sample. Confirmatory factor analyses (Hoyle & Lennox, 1991; Miller & Thayer, 1989) have established the factor structure of the SMS-R. These analyses have determined three factors consisting of other-directedness, extraversion, and acting ability. Buchanan & Smith performed the same factor analyses with both the traditional and Internet samples. They found that the Internet data showed a better fit than the traditional sample on four of the six indices used. Additionally, the Internet data produced fit indices that were better than the indices reported in the original studies (Buchanan & Smith, 1999). Although this study only used the SMS-R, the results show that similar results

can be obtained whether the survey is completed in the traditional manner or administered over the Internet.

An important issue in Internet-based research is whether a researcher has the ability to successfully target a specific population. As a follow up to the previously discussed study, Buchanan & Smith completed another study in which they recruited subjects from newsgroups. Specifically, they advertised their web page in 'high' self-monitoring newsgroups and 'low' self-monitoring newsgroups. They found subjects from the 'high' self-monitoring newsgroups to score significantly higher on the SMS-R than those from the 'low' self-monitoring newsgroups. These results indicate that SMS-R has construct validity and that it is possible to use newsgroups to target appropriate populations for web-based research projects (Buchanan & Smith, in press).

These studies, and other similar work (Buchanan, 1998; Krantz et al., 1997) suggest the functional equivalency of Internet research and traditional research methods. Additionally, the ability to successfully reach specific populations is a very important finding for researchers interested in targeting groups such as women with breast cancer. Internet use in personality research is becoming more popular, while the use of the Internet as a research tool in health psychology has been more limited, if not nonexistent.

Advantages of Internet research.

There are many advantages to using the Internet as a research tool. By allowing potential subjects to log in from their home or office computer, the problem of sampling a geographically restricted population is eliminated, and it is possible to collect data from a very heterogeneous sample. In fact, there is the potential to gather data from individuals from all over the world. Additionally, the Internet makes it easier to access a large number of people with an interest in a very narrow topic domain, such as breast cancer. Another advantage to doing web-based research is a possible increased level of self-disclosure when surveys are completed on a computer due to anonymity (Levine, Ancill, & Roberts, 1988; Locke & Gilbert, 1995). Furthermore, this enhanced anonymity may reduce subjects' need to conform to social norms and demand characteristics (Buchanan, 2000; Hewson, Laurent, & Vogel, 1996). Use of the Internet as a research tool may also save time and money. Web based surveys eliminate the need for paper resources, mailing and publishing costs, as well as the need for laboratory space with the always present scheduling and personnel problems. More importantly, because data is automatically entered into a usable database, web based surveys eliminate the need for data entry

and the possibility of human error when transferring data from paper to computer. Additionally, while respondents are entering the data as they log onto the web page, it is possible to conduct preliminary data checks to see if the study is addressing the hypotheses of interest as the data is already in usable form. In this way, the researcher can determine if there is some fundamental flaw in the study design early in the data collection process. Web pages can also be dynamic and interactive, making the experience of participation more appealing to the subject and may help retain user interest as well as generate additional subjects (Buchanan, 2000; Reips, 2000; Schmidt, 1997).

Validity of research on the Internet.

The Internet is a new tool for doing psychological research, in the same vein that Skinner's operant chamber was new for studying reinforcement. With every new advance in research techniques or modalities, there is also the requirement of ensuring the new methods reveal and measure what they intend. The validity of Internet research must be established for it to become a viable and successful research tool. As discussed earlier, one possible validity test would be to compare the results of an Internet-based study to a laboratory-based study (see Buchanan & Smith, 1999 and Krantz et al., 1997). This approach has been successfully used to establish the validity of using the Internet to survey human sexual behavior (Baily, Foote, & Throckmorton, 2000), identify facial features across cultures (Pagani & Lombardi, 2000), and measure test anxiety (Mueller, Jacobsen, & Schwarzer, 2000). Another method of establishing validity is to examine the research and see if the results adhere to theoretically predicted trends (Krantz & Dalal, 2000). Buchanan (1998) and Buchanan & Smith (1999) compared Internet survey results with previous publications that established the psychometric properties of the self-monitoring scale they were researching. They found strong agreement between the Internet population surveyed and previous laboratory populations (Buchanan, 1998; Buchanan & Smith, 1999). A measure of self-trust under development was tested with both a traditional sample and a Internet sample simultaneously. The internal consistency, inter-item correlation, item mean, and standard deviations were very similar between the two samples (Pasveer & Ellard, 1998).

The external validity of Internet research is also an issue that must be addressed. A good proportion of research completed at the university level has been described as the study of the behavior of the suburban White American college sophomore (Krantz & Dalal, 2000). There is some evidence that the Internet may in fact dramatically increase the generalizability of

psychological findings, in relation to subject age and geographic location. Presently, the majority of Internet users are white, female, and predominantly from the United States, Europe, Canada, and Oceania (Krantz & Dalal, 2000), although as the Internet grows, more heterogeneous samples may become available across the globe.

Disadvantages of Internet research.

Internet-based research possesses several potential disadvantages. One disadvantage pertains to the possibility of multiple submissions or incomplete submissions. To protect against multiple submissions, it is possible to tag each entry with the address of the computer where the subject completed the survey. When reviewing the database, multiple submissions can be weeded out. To control for incomplete submissions, the web page can be designed to inform the respondent that they have skipped questions prior to allowing submission of the entry. If there are questions that the subject does not wish to respond to, then they can be given that choice when the web program takes them back through the surveys to the skipped questions. Self-selection of subjects could be another disadvantage for Internet research, especially if the link to the survey page is only available on a limited number of pages. Self-selection refers to selective participation in Internet studies due to their voluntary nature. One way to avoid this problem is to advertise the survey on multiple sites, thus potentially accessing a much wider range of prospective subjects.

Environmental control is also an issue, but there is little the experimenter can do to ensure a consistent and stable research environment for all participants. Individuals who fill out on-line surveys have the ability to do so at any computer that is connected to the Internet, but this does not ensure they won't be interrupted by co-workers if at work, or by children if at home. Additionally, there may be background noise and disturbances as well as climate problems if they are in a very cold or very hot room.

Web research has also shown to have very high drop out rates (Reips, 2000). Drop-outs in Internet research are individuals who begin the survey but then decide not to finish and do not submit what they have completed. Drop-out rate can be tracked by recording partially completed records as well as overall web site hits and compare these numbers to completed surveys. Drop-out rate of web research has been shown to range from 1 to 87% (Musch & Reips, 2000). Musch & Reips speculate that this very large range may indicate there are motivational factors that influence drop-out. Specifically, they cite monetary reward for participation and the concern

about sending personal information over the Internet as the most obvious concerns potential participants may have. Frick and colleagues manipulated these two factors in several experiments and found a drop-out rate of 22% when no monetary reward was offered and confidentiality issues were covered after completion of the experiment. When monetary reward was offered and confidentiality issues were discussed prior to survey completion, the drop- out rate reduced to 5.7&% (Frick, Bachtiger, & Reips, 1999). Complexity and length of the study may also be contributing factors to high drop-out rate. It would be beneficial to the researcher to have colleagues do trial runs of the web-based survey in order to receive feedback regarding complexity of instructions and survey questions as well as whether the amount of time required is reasonable. Other issues that may help control drop-out rate are creating an attractive web site, emphasizing the trustworthiness of the site by using institutional name, describing scientific purpose, ensuring confidentiality, and providing contact information to answer any questions or concerns users may have. Additionally, the web designer may offer some form of feedback to the user, such as a personality profile.

The usability of the web page on various platforms is another area that the researcher must investigate thoroughly. There are two standard web browsers that are used by the majority of Internet users (Microsoft Explorer and Netscape Navigator), but there are many different versions of these browsers. To ensure there won't be any problems viewing the survey, the researcher should systematically test the web page on different versions of these browsers, as well as on different types of PC and MAC platforms. Additionally, the researcher should design the web page for quick loading, taking into consideration the different Internet service providers and different modem speeds available.

While it is not possible to conduct all types of research over the Internet, for the many areas of psychology where this is a viable alternative, the advantages may well outweigh the disadvantages. Many of the problems discussed may be solved by careful planning, good web page design, and sound experimental methodology. As this method of research becomes more popular, and more studies are put 'on-line', additional problems will surface as well as better solutions to those issues that are already known. The studies that have been completed and published to date that utilized the Internet show that the web may be a powerful new tool for psychological research.

Study Aims and Hypotheses

The present study has two general aims. Using the framework provided by Lepore's social cognitive theory of adaptation to trauma (Lepore, 1997; Lepore & Helgeson, 1998; Lepore et al., 1996), the present study will examine the role of social (social support, social constraints) and dispositional (EI) characteristics, presumably associated with emotional disclosure and expression in long-term psychological adaptation to breast cancer. A second general aim will be to test the viability of using the Internet as a means of conducting research with a specific clinical population, in this case women with breast cancer.

In addition to these two general study aims, there are several specific hypotheses that will be tested. It is hypothesized that women who perceive more social constraints from friends and family when discussing their cancer experience will report more psychological distress, consistent with Lepore's social cognitive theory of adaptation to trauma (Lepore, 1997; Lepore & Helgeson, 1998; Lepore et al., 1996). Second, also consistent with Lepore's social cognitive theory of adaptation to trauma, it is hypothesized that women who report more social support will also report lower psychological distress. Third, it is hypothesized that those women who are high in EI will report lower psychological distress.

# Chapter Two

## Method

### Sample

Participants for this study were recruited through advertisement of the web page to five different internet-based breast cancer support groups and newsgroups. These advertisements included a description of the study, explained the task involved including the time required, and asserted the confidentiality of the responses. The on-line groups had an approximate current membership of 2500 breast cancer patients and survivors. To be eligible for inclusion in the study, a woman had to be: (a) at least 18 years old; (b) be within 120 months of diagnosis of breast cancer; (c) be able to read and understand English, (d) have access to a computer and the WWW. Because this study utilized the WWW, data was collected from all potential subjects who visited the site and completed at least part of the survey. Only those respondents who met the criteria for this study had their data included in the final analyses. All potential subjects were informed that participation in this study was strictly voluntary and that they may excuse themselves at any time from the experiment without risk of penalty by simply closing the web page. Additionally, email links were available at the beginning and at the end of the survey, so if a question was not understood, the respondent could have emailed the investigator for clarification or comment. Additional ethical guidelines for Internet research were adhered to as discussed by Michalak & Szabo (1998). These included, but were not limited to, informing the respondents that the study is designed for scientific purposes, and obtaining informed consent, the assurance of confidentiality of submitted data, and affiliation of the web page with the University of Kentucky.

A total of 243 women completed the on-line survey over a period of 33 days. Of these records, 32 (13%) were incomplete in that they were missing at least one whole survey. These records were removed from the dataset and were not included in further analyses. Additionally, 21 (8.6%) records were removed from further analyses because the subjects were greater than 120 months since their diagnosis. The final study sample consisted of 190 women with a mean age of 48.3 years (SD = 8.9; range = 22.4-69.0) and a mean of 30.5 months since diagnosis (SD = 23.4; range = 3.9-106.1). Disease stage at diagnosis was: Stage 0 (n=13, 6.8%), Stage I (n=61, 32.1%), Stage II (n=93, 48.9%), Stage III (n=20, 10.5%), and stage IV (n=3, 1.6%). The majority of the women in the sample had undergone either a lumpectomy (n=82, 43.2%) or a

mastectomy (n=84, 44.%), with a smaller number of women having undergone both a lumpectomy and a mastectomy (n=24, 12.6%). Adjuvant therapy consisted of chemotherapy alone (n=45, 23.7%), radiotherapy alone (n=27, 14.2%), or chemotherapy and radiotherapy (n=101, 53.2%). Seventeen women (8.9%) reported receiving no adjuvant therapy. Clinical information for the participants is shown in Table 1.

Demographic characteristics of the sample are as follows: 92% were Caucasian, 77% were married or cohabitating, 72% were employed. Participants had an average of 15.4 years of education and the median annual household income range was $20,000-$40,000. The majority of the participants were from the United States (n=160, 84.2%). Participants were also from six other geographic locations including Canada (n=13), Australia (n=5), United Kingdom (n=4), Western Europe (n=2), Eastern Europe (n=1), and Asia (n=1). The 160 women from the United States came from 39 different states. The most frequently represented states were Florida (n=17), California (n=12), New York (n=11), Ohio (n=9), Pennsylvania (n=9), and Texas (n=8). Geographic location was not reported by five participants. A more complete description of participants sociodemographic characteristics is shown in Table 2.

The web-site received a total of 2,086 visitors during the 33 days the study was available, giving an average of 63.2 visitors per day and an accrual rate of 11.6% (243 respondents/2,086 visitors). The average visitor stayed for about 7 seconds and viewed six of the ten pages of the study. The average time of study completion for women providing complete data was 14 minutes (SD = 45 seconds; range = 6-51 minutes). The site received the most visitors during the hours of 7 and 10 pm (27.8%), while the women who completed the study most commonly logged on during the hours of 5pm and 6pm (9.5%), and between 9pm and 12am (27.4%). The site also received the most visitors Monday through Friday, averaging 353 visitors per day over the five weekdays. Weekend visitors were not as frequent, with an average of 159 visitors on Saturdays and Sundays.

Procedure

Participants who completed the study logged onto the web page and completed the study from their home, work-site, or other (e.g., public library) computer. The study began with a brief introduction and an informed consent. This was followed by a demographics and health questionnaire, which included questions related to breast cancer diagnosis and treatment. The remainder of the web pages consisted of the questionnaires chosen for this study (described

below). Participants were thanked for filling out the survey on the final page of the web site. Additionally, they were informed that information regarding the results of this study would be posted to the appropriate on-line support groups. Women who did not hear about the study through an on-line support group and were interested in receiving results of the study, were asked to email the principal investigator with this request via the email link provided.

Instruments

Demographics/medical information. Participants began by completing a demographics and medical information questionnaire. The demographics section asked for information regarding the participant's age, birth date, ethnic background, education, household income, marital status, number of children, number of children living at home, and geographic location. The medical information questionnaire asked about date of breast cancer diagnosis, stage of disease, type of treatment received, and date of last treatment.

Trait Meta-Mood Scale (TMMS). The TMMS (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) is a self-report questionnaire that assesses emotional intelligence, specifically attention to feelings, clarity of feelings, and mood repair. Subjects respond on a 5-point scale, which ranges from "Strongly Disagree" (1 point) to "Strongly Agree" (5 points). The TMMS can be scored using any of the three subscales of attention, clarity, and repair, or the survey may be interpreted using the full-scale score only. For this study, the 30-item version of the TMMS was used. This scale has exhibited good convergent and discriminant validity and good internal consistency for the three subscales (attention: $\alpha = 0.86$, clarity: $\alpha = 0.88$, and repair: $\alpha = 0.82$) (Salovey et al., 1995). Coefficient alpha's for this study were .88 for the full-scale, .83 for the "attention to feelings" subscale, .87 for the "clarity of feelings" subscale, and .82 for the "mood repair" subscale.

Impact of Event Scale (IES). The IES (Horowitz, Wilner, & Alvarez, 1979; Zilberg, Weiss, & Horowitz, 1982) is a fifteen-item self-report measure of intrusive and avoidant cognition. It has been used in evaluating stress reactions after traumatic experiences, such as cancer or other life-threatening diseases (Cella & Tross, 1986; Cordova et al., 1995). Subjects respond on a 4-point scale regarding how often they have experienced specific symptoms during the past week. The scale ranges from "not at all" to "often." The IES has exhibited test-retest stability with an interval of one week (full scale $\underline{r} = 0.87$, intrusions $\underline{r} = 0.89$, avoidance $\underline{r} = 0.79$) and has a total split-half reliability of 0.86. The internal consistencies for intrusions and

avoidance are 0.78 and 0.82 respectively. The IES was keyed to the experience of having breast cancer. Respondents read the following introduction to the IES prior to completing the questionnaire: "Below is a list of comments made by people after stressful life events. Please read each item, and then indicate how frequently these comments were true for you during the past 7 days with respect to your experience with cancer" (Cordova, 1999). Coefficient alpha's for the present study were .86 for the IES total score. The subscale score coefficient alpha's were .88 and .75 for the intrusions and avoidance scales, respectively.

Social Constraints Scale (SCS). The SCS (Lepore, 1997) is a 15-item self-report measure of the extent to which the respondent's social environment inhibits expression of trauma related thoughts and feelings. This study used the "friends/family" version of the SCS. Subjects responded on a 4-point scale regarding how often they have had a number of social experiences in the past month. The scale ranges from "never" to "often." The test-retest reliability of the SCS is 0.71 at nine months, and Cronbach's alpha has ranged from 0.89 to 0.92 (Lepore, 1997). Coefficient alpha for the SCS was .95 for the present study.

Duke-UNC Functional Social Support Questionnaire (DUKE-SSQ). The DUKE-SSQ (Broadhead, Gehlbach, De Gruy, & Kaplan, 1988) is an eight-item, multidimensional, functional social support questionnaire designed for use with medical populations. Subjects respond on a 5-point scale regarding their level of satisfaction with the amount of support they receive from others in various areas. The scale ranges from "much less than I would like" to "as much as I would like." The DUKE-SSQ yields a total score, and has shown good internal consistency ($\underline{r}$ = 0.86) in previous use with cancer survivors (Andrykowski & Cordova, 1998). Coefficient alpha for the DUKE-SSQ was .88 for the present study.

Hospital Anxiety and Depression Scale (HADS). The HADS (Zigmond & Snaith, 1983) is a brief, self-report measure of anxiety and depression specifically designed for patients with physical illness. The HADS consists of 14 items: seven for depression and seven for anxiety. Subjects respond on a 4-point scale, according to how often they have felt that way in the past week. Scores on each scale range from 0 to 21, with 0 to 7 falling in the normal range, 8 to 10 in the borderline range, and 11 to 21 in the abnormal range (Carrol, Kathol, Noyes, Wald, & Clamon, 1993). The internal consistency reliability coefficients for the HADS subscales range from .76 to .41 (Zigmond & Snaith, 1983). Coefficient alpha's for the present study were .84 for the anxiety scale and .83 for the depression scale.

## Apparatus

Software. The web pages were developed using Dreamweaver UltraDev Version 4 by Macromedia Corporation. This software package is a professional visual editor for creating and managing web sites and pages. The survey pages were written in ASP 2.0 code, which allows the programmer to include data fields that are linked directly to a database. The data from each record was automatically downloaded to an Access database after the respondent completed each survey by hitting a 'submit' button at the bottom of each page. The database was then transformed into a format that is usable by SPSS. The 'submit' button also created a timestamp for each record. An estimate of the time spent completing the questionnaires was computed from differences between the first and last timestamp in each record.

## Statistical Analysis

All statistical analyses were completed using the Statistical Package for the Social Sciences, Release 10.0.0 (SPSS Inc., 1989-2000). The criterion for statistical significance was set at .05. There were two types of missing data in this study: sporadic missing data, and records where complete questionnaires were missing. Sporadic missing data constituted less than 1% of all items, and were corrected by using mean substitutions. When complete questionnaires were left blank, that specific record was not used in data analyses (n=32, 13%).

# Chapter Three

## Results

### Descriptive Characteristics of Sample

Means, standard deviations, ranges and internal consistency estimates of reliability for all psychosocial measures are shown in Table 3. These variables are organized into the areas of social support and social constraints as measured by the DUKE-SSQ and the SCS, emotional intelligence as measured by the TMMS, and psychological distress as measured by the IES and HADS. Table 4shows the intercorrelations among clinical and demographic variables, TMMS, SCS, DUKE-SSQ and distress measures. Additionally, Pearson Product Moment correlations between TMMS, DUKE-SSQ, SCS scores, and age, education, and time since diagnosis with all distress measures are shown in Table 5.

### Hierarchical Regression Analyses

To test the hypotheses regarding the relationship between current psychological adjustment and demographic, clinical, and psychosocial variables, a series of hierarchical regression analyses were performed. The independent variables were grouped into three sets representing demographic variables, clinical variables, and psychosocial variables. Demographic variables included age, number of years of education, and marital status (single or partnered). Clinical variables included time since diagnosis (in months), type of surgery (lumpectomy or mastectomy), type of treatment received (four ordinal groupings: none, radiation, chemotherapy, radiation and chemotherapy), and stage of disease. Psychosocial variables included total score from the TMMS, full-scale score from the SCS, and full-scale score from the DUKE-SSQ. Five parallel regression models were run, with the above listed 10 independent variables identical for each model. The first model was regressed on the depression score from the HADS, the second model was regressed on the anxiety score from the HADS, the third model was regressed on the total score from the IES, the fourth model was regressed on the intrusions score from the IES, and the fifth model was regressed on the avoidance score from the IES. Results of these analyses are shown in Tables 6 and 7.

For the HADS-depression regression equation, the model that emerged accounted for 40% of the variance in self-reported depression, $F(10, 179)=11.55$, $p<.001$. This model consisted of six significant individual predictor variables. The significant predictor variables included type of surgery, beta=.13, $t(190)=2.13$, $p<.05$; stage of disease, beta=.15, $t(190)=2.13$,

p<.05; time since diagnosis, beta = -.18, t(190)=-2.82, p<.01; DUKE-SSQ total score, beta=-.21, t(190)=-2.93, p<.01; SCS total score, beta=.25, t(190)=3.56, p<.01; and TMMS-total score, beta=-.27, t(190)=-4.52, p<.01. Participants who were more recently diagnosed, who had a mastectomy, had a more advanced stage of disease at diagnosis, had less social support, had more social constraints, and were not as emotionally intelligent, reported greater depressive symptomatology.

For the HADS-anxiety regression equation, the model that emerged accounted for 29% of the variance in self-reported anxiety, F(10, 179)=7.26, p<.001. This model consisted of two significant predictor variables which included SCS total score, beta=.36, t(190)=4.87, p<.001; and TMMS-total score, beta=-.28, t(190)=-4.29, p<.001. Participants who had more social constraints and were not as emotionally intelligent, reported greater symptoms of anxiety.

For the IES total score regression equation, the model that emerged accounted for 32% of the variance in IES total score, F(10, 179)=8.50, p<.001. This model consisted of three significant individual predictor variables. The significant predictor variables included: time since diagnosis, beta=-.17, t(190)=-2.51, p<.05; SCS total score, beta=.44, t(190)=5.96, p<.001; and TMMS total score, beta=-.24, t(190)=-3.84, p<001. Participants who scored higher on the total score for the IES were more recently diagnosed, had more social constraints, and were lower in emotional intelligence.

For the IES-intrusions regression equation, the model that emerged accounted for 26% of the variance in self-reported occurrence of intrusive thoughts, F(10, 179)=6.29, p<.001. This model consisted of two significant individual predictor variables: time since diagnosis, beta = -.15, t(190)=-2.14, p<.05; and SCS total score, beta=.44, t(190)=5.81, p<.001. Participants who more recently diagnosed and had more social constraints, reported more breast cancer-related intrusive ideation.

For the IES-avoidant regression equation, the model that emerged accounted for 27% of the variance in self-reported occurrence of avoidant thoughts, F(10, 179)=6.74, p<.001. This model consisted of two significant individual predictor variables. The significant predictor variables included SCS total score, beta=.29, t(190)=3.78, p<.001; and TMMS total score, beta=-.37, t(190)=-5.69, p<.001. Participants who had more social constraints, and were less emotionally intelligent, reported more breast cancer-related avoidant cognitions.

The unique variance accounted for by the significant predictor variables in the above regression analyses is represented by the squared semi-partial correlation coefficient, as shown in Tables 6 and 7. These results clearly indicate that the SCS score and the TMMS score consistently account for more unique variance than the other predictor variables, with the exception of the IES intrusions model. In this latter model, only the SCS score accounted for an appreciable proportion of unique variance.

Best Fit Regression Analyses

To determine the "best fit" regression model for each of the five dependent variables, the individual predictors from the 10 variable model were eliminated in step-wise, backward fashion. The criterion for eliminating variables was set at p=.05. The results of the five "best fit" regression analyses are shown in table 8.

For the HADS-depression regression equation, the "best fit" model that emerged accounted for 38% of the variance in self-reported depression, $F(6, 183)=18.36$, $p<.001$. This model consisted of six significant predictor variables. The significant predictor variables included stage of disease at diagnosis, beta=.13, $t(190)=2.11$, $p<.05$; type of surgery, beta=.14, $t(190)=2.28$, $p<.05$; time since diagnosis, beta = -.21, $t(190)=-3.61$, $p<.001$; DUKE-SSQ total score, beta=-.21, $t(190)=-3.05$, $p<.01$; SCS total score, beta=.27, $t(190)=3.90$, $p<.001$; and TMMS-total score, beta=-.28, $t(190)=-4.69$, $p<.001$. The "best fit" model indicates that participants who were more recently diagnosed, who had a more advanced stage of disease at diagnosis, who had a mastectomy, had less social support, had more social constraints, and were less emotionally intelligent, reported greater depressive symptomatology.

For the HADS-anxiety regression equation, the "best fit" model that emerged accounted for 26% of the variance in self-reported anxiety, $F(2, 187)=33.33$, $p<.001$. This model consisted of two significant predictor variables which included SCS total score, beta=.38, $t(190)=6.01$, $p<.001$; and TMMS-total score, beta=-.29, $t(190)=-4.57$, $p<.001$. The "best fit" model indicates that participants who had more social constraints and were less emotionally intelligent, reported greater symptoms of anxiety.

For the IES total score regression equation, the "best fit" model that emerged accounted for 29% of the variance in IES total score, $F(3, 186)=25.09$, $p<.001$. This model consisted of three significant predictor variables. The significant predictor variables included: time since diagnosis, beta=-.16, $t(190)=-2.55$, $p<.05$; SCS total score, beta=.41, $(190)=6.53$, $p<.001$; and

TMMS total score, beta=-.25, t(190)=-3.93, p<001. The "best fit" model indicates that participants who scored higher on the total score for the IES were more recently diagnosed, had more social constraints, and were lower in emotional intelligence.

For the IES-intrusions regression equation, the "best fit" model that emerged accounted for 21% of the variance in self-reported occurrence of intrusive thoughts, F(2, 187)=25.15, p<.001. This model consisted of two significant predictor variables: time since diagnosis, beta = -.16, t(190)=-2.42, p<.05; and SCS total score, beta=.43, t(190)=6.59, p<.001. The "best fit" model for IES-intrusions indicates that participants who more recently diagnosed and had more social constraints reported more breast cancer-related intrusive ideation.

For the IES-avoidant regression equation, the "best fit" model that emerged accounted for 24% of the variance in self-reported occurrence of avoidant thoughts, F(2, 187)=29.90, p<.001. This model consisted of two significant predictor variables which included SCS total score, beta=.27, t(190)=4.16, p<.001; and TMMS total score, beta=-.38, t(190)=-5.82, p<.001. The "best fit" model for IES-avoidance indicates that participants who had more social constraints, and were less emotionally intelligent reported more breast cancer-related avoidant cognitions.

In essence, the "best fit" models mirror tables 6 & 7 with regard to what the significant predictors are. They also demonstrate that for most distress variables, 2-3 variables can account for about 25% of the variance.

Interaction Analyses for Emotional Intelligence

To examine whether emotional intelligence interacted with either social support or social constraints to influence current psychological adjustment, additional regression models were constructed. For each of the five dependent variables representing psychological adjustment, a variable representing the interaction between emotional intelligence and social constraints (i.e., TMMS total score X SCS total score) was added as a fourth step in the analyses to the original 10 variable hierarchical regression models. (see tables 6 and 7). The Emotional Intelligence X Social Constraints interaction was not significant for any of the five measures of psychological adjustment (all p's>.05).

An identical set of five hierarchical regression analyses was then conducted to test whether the Emotional Intelligence X Social Support interaction added to the prediction of psychological adjustment. The Emotional Intelligence X Social Support interaction was significant only for one of the five measures of psychological adjustment: IES Avoidance

subscale score (beta=.13, t(190)=1.99, p<.05). Specifically, participants who were low in emotional intelligence and low in social support reported more avoidant cognitions while participants who were high in emotional intelligence and low in social support reported the fewest avoidant cognitions (see Figure 1).

Hierarchical Regression Analyses with TMMS Subscales

To further investigate the effect of emotional intelligence on psychological adjustment, a set of hierarchical regression models were run using the subscales of the TMMS, in place of the TMMS total score. For these models, the previously used predictor variables representing demographic, clinical, and psychosocial domains are maintained. The three subscales of the TMMS represent attention to mood, clarity of mood, and active mood repair. Results of these analyses are shown in Tables 9 and 10.

For the HADS-depression regression equation with TMMS subscales, the model that emerged accounted for 45% of the variance in self-reported depression, F(12, 177)=12.00, p<.001. This model consisted of six significant predictor variables. The significant predictor variables included stage of disease at diagnosis, beta=.14, t(190)=2.21, p<.05; time since diagnosis, beta = -.23, t(190)=-3.70, p<.001; DUKE-SSQ total score, beta=-.20, t(190)=-2.91, p<.01; SCS total score, beta=.17, t(190)=2.46, p<.05; clarity of moods subscale score of the TMMS, beta=-.19, t(190)=-2.93, p<.01; and mood repair subscale of the TMMS, beta=-.31, t(190)=-4.92, p<.001. The model indicates that participants who were more recently diagnosed, who had a more advanced stage of disease at diagnosis, had less social support, had more social constraints, and less able to understand their moods, and were less able to engage in active mood repair , reported greater depressive symptomatology.

For the HADS-anxiety regression equation with TMMS subscales, the model that emerged accounted for 37% of the variance in self-reported anxiety, F(12, 177)=8.73, p<.001. This model consisted of three significant predictor variables which included SCS total score, beta=.27, t(190)=3.66, p<.001; clarity of moods subscale score of the TMMS, beta=-.22, t(190)=-3.29, p<.01; and mood repair subscale of the TMMS, beta=-.34, t(190)=-5.12, p<.001. The model indicates that participants who had more social constraints, were less able to understand their moods, and were less able to engage in active mood repair, reported greater symptoms of anxiety.

For the IES total score regression equation with TMMS subscales, the model that emerged accounted for 35% of the variance in IES total score, $F(12, 177)=5.47$, $p<.001$. This model consisted of three significant predictor variables. The significant predictor variables included: time since diagnosis, beta=-.20, $t(190)=-2.94$, $p<.01$; SCS total score, beta=.38, (190)=5.14, $p<.001$; and clarity of moods subscale of the TMMS, beta=-.26, $t(190)=-3.78$, p<001. The model indicates that participants who scored higher on the total score for the IES were more recently diagnosed, had more social constraints, and were less able to understand their own moods.

For the IES-intrusions regression equation with TMMS subscales, the model that emerged accounted for 31% of the variance in self-reported occurrence of intrusive thoughts, $F(12, 177)=6.60$, $p<.001$. This model consisted of four significant predictor variables: time since diagnosis, beta = -.20, $t(190)=-2.85$, $p<.01$; SCS total score, beta=.37, $t(190)=4.78$, $p<.001$, attention to moods subscale score of the TMMS, beta=.18, $t(190)=2.51$, $p<.05$; and mood repair subscale of the TMMS, beta=-.19, $t(190)=-2.78$, $p<.01$. The model for IES-intrusions indicates that participants who more recently diagnosed, had more social constraints, were more attentive to their moods, and were less able to engage in active mood repair, reported more breast cancer-related intrusive ideation.

For the IES-avoidant regression equation with TMMS subscales, the model that emerged accounted for 30% of the variance in self-reported occurrence of avoidant thoughts, $F(12, 177)=6.23$, $p<.001$. This model consisted of two significant predictor variables which included SCS total score, beta=.28, $t(190)=3.58$, $p<.001$; and clarity of moods subscale score of the TMMS, beta=-.35, $t(190)=-4.80$, $p<.001$. The model for IES-avoidance indicates that participants who had more social constraints, and were less able to understand their own moods reported more breast cancer-related avoidant cognitions.

# Chapter Four

## Discussion

The results of the present study support the view that psychological distress associated with the experience of breast cancer diagnosis and treatment may be related, in part, to psychosocial factors. Findings support the hypothesis that participants who reported low social constraints reported lower levels of psychological distress. Also consistent with hypotheses, participants who were high in emotional intelligence also reported lower levels of psychological distress. Surprisingly, there was little support for the hypothesis that better social support would predict lower psychological distress

The use of the Internet in behavioral research was also tested in this study. The results indicate that it is possible to successfully target a specific population, in this case women with breast cancer, for psychological research. The accrual rate of 11.6% also indicates that there was sufficient interest to achieve an adequate number of participants in the 33 days the study was on-line. Additionally, the sample was geographically diverse. These data demonstrate that Internet based data collection is a potentially useful research method in psychological research, and in health-psychology in particular.

### Factors Associated with Psychological Distress

Previous research and theory suggests three distinct groups of variables may be associated with psychological adjustment and distress levels in breast cancer patients: (a) demographic variables such as age and education level, (b) clinical variables such as stage of disease and type of surgery, and (c) psychosocial variables such as social support, and previous stressful or traumatic events (Rowland & Massie, 1998). The analyses in this study used age, education level, and marital status as the demographic factors; time since diagnosis, stage of disease, type of surgery, and type of adjuvant treatment as the clinical factors; and social support, social constraints, and EI as the psychosocial factors.

The results from the regression analyses demonstrate that by and large, the demographic and clinical variables are not associated with psychological distress in breast cancer survivors. Specifically age, marital status, and education were not significant predictors of psychological distress in any of the hierarchical or best-fit regression models. The clinical variables also were not significant predictors of psychological distress, with several exceptions. Time since diagnosis was a significant predictor in the HADS-depression model and in the IES total score

and IES-intrusions model, although the unique variance attributed to this predictor was small (2.7%, 2.4%, and 1.9% respectively). Type of surgery (lumpectomy vs. mastectomy) and stage of disease were significant predictors in the HADS-depression model, but not in any of the other regression models. Again, the unique variance attributed to these specific predictors was small, with each variable capturing only 1.5% of the variance.

The psychosocial variables accounted for the majority of the variance in each regression model. More specifically, the social constraints score was found to be a significant predictor in all of the models, with the unique variance attributable to this variable ranging from 5.8% for the IES Avoidance model to 14% for the IES Intrusions model. Conversely, social support was a significant predictor of distress in only the HADS-Depression model, accounting for 2.9% of the unique variance. The total score from the TMMS, representing an overall measure of EI, was a significant predictor in all the models except IES-Intrusions. The unique variance attributable to this variable ranged from 5.6% for the IES Total Score model to 13.1% for the IES Avoidance model. The TMMS total score also accounted for 7.0% and 7.3% of the unique variance in the HADS Depression and Anxiety models, respectively.

When the TMMS subscales were entered into the models, at least one of the subscales (attention to moods, clarity of moods, and mood repair) was significant in each model. Attention to moods was a significant predictor in only the IES-Intrusions model, accounting for 2.5% of the unique variance. Mood repair was also a significant predictor in this model, accounting for 3.0% of the variance. Mood repair appeared to be a much stronger predictor in the HADS Depression and Anxiety models, accounting for 7.6% and 9.3% of the unique variance respectively. Clarity of moods was a significant predictor in all of the models except IES-Intrusions, with a range of 2.7% of the unique variance in the HADS-Depression model to 9.2% of the unique variance in the IES-Avoidance model. Consistent with previous literature, these results demonstrate that by and large it is the psychosocial variables, and not demographic and clinical variables, that are most important to psychological distress and adjustment in cancer patients (Spencer, Carver, & Price, 1998).

Social Cognitive Processing Model

The first primary aim of this study was to examine the role of social (social support, social constraints) and dispositional (EI) characteristics associated with emotional disclosure and expression, in long term psychological adaptation to breast cancer. This was accomplished by

building on the framework provided by Lepore's social cognitive theory of adaptation to trauma (Lepore et al., 1996; Lepore, 1998). Lepore and his colleagues, as well as other researchers investigating this model (Stanton et al., 2000), have established the importance of a supportive social environment which allows the individual an opportunity to discuss trauma related thoughts, feelings, and emotions. A supportive social environment can be an important predictor of successful psychological adjustment, fostering cognitive processing, emotional disclosure, and reducing distress. A social environment that is constraining will inhibit emotional disclosure and therefore reduce the likelihood of successful cognitive processing of trauma related information, thoughts, and feelings (Lepore & Helgeson, 1998).

The data from this study indicate that social support was, for the most part, not significantly associated with psychological adjustment. The lone exception was the HADS-Depression score where the results indicated that the participants reporting more depressive symptomatology also tended to report poor social support. The other measures of distress used in this study were not significantly associated with social support in the multivariate context.

In contrast, social constraints was consistently associated with psychological adjustment. The SCS total score was found to be significantly associated with psychological adjustment in all the regression models, with women who reported more social constraints reporting more psychological distress. The combination of experiencing a possible traumatic event such as breast cancer diagnosis and treatment, and having a socially constraining environment when trying to discuss thoughts and feelings about breast cancer may contribute to symptoms of depression and feelings of anxiety associated with the disease. In the present study, social constraints accounted for 4.3% of the unique variance in the HADS-Depression model and 9.4% of the unique variance in the HADS-Anxiety model. Breast cancer patients who perceived that individuals in their social environment did not want to discuss their cancer experiences were more depressed, had more feelings of anxiety, and reported more breast cancer related distress.

Women who experience social constraints may also avoid thinking about their breast cancer related experiences, which may inhibit cognitive processing. Previous research has shown a positive relationship between social constraints from family and friends and avoidant behavior regarding cognitive processing of cancer related thoughts and feelings in men with prostrate cancer (Lepore & Helgeson, 1998). In the present study, social constraints were positively associated with the IES-Avoidance score ($b=.29$, $p<.001$), and accounted for 5.8% of

the unique variance in the IES-Avoidance model indicating that women who perceived social constraints in their environment showed less attention towards breast cancer related thoughts or feelings.

In addition to more avoidant behavior of cancer related stimuli, cognitive processing may also be limited by cancer-related intrusive ideation. Intrusive thoughts may take the form of recurrent memories, dreams, or flashbacks about the stressful event. The intrusive experience may be functional, in that intrusive thoughts may lead to activation of the memory network, gradually reducing psychological distress in the long term (Creamer et al., 1992). This benefit may be limited by avoidant behavior and social constraints. That is, the positive aspects of exposing the memory network to cancer related thoughts and feelings may be inhibited when the individual avoids thinking about breast cancer related experiences and perceives a socially constraining environment. In this fashion, the intrusive experiences may be dysfunctional, leading to greater distress and more avoidant behavior. In the present study, social constraints were positively associated with the IES-Intrusions score ($b=.44$, $p<.001$), and accounted for 14.0% of the unique variance in the IES-Intrusions model indicating that women who perceived social constraints also experienced more intrusive ideation regarding their breast cancer experience.

Emotional Intelligence and Psychological Adjustment

The second primary aim of this study was to examine the possible contribution of the dispositional characteristic EI in facilitating emotional disclosure and expression in long term psychological adaptation to breast cancer. A construct most often applied in industrial/organizational psychology, EI may be related to emotional disclosure tendencies and thus potential adaptation to trauma (Mayer & Salovey, 1993). Previous research has shown that individuals high in EI are better able to regulate affect within themselves and within others (Mayer & Salovey, 1993), are more empathic (Mayer & Geher, 1996), are more attentive to their moods, have a better sense of clarity towards their moods, and are better able to actively repair their mood states (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Based upon social cognitive theory of adjustment to trauma (Lepore et al., 1996; Lepore, 1998), these studies suggest that individuals high in EI might evidence better psychological adjustment following breast cancer diagnosis and treatment.

The full scale score of the TMMS is intended to represent an overall measure of EI. When the full scale score of the TMMS was used in the regression models, it was a significant predictor of psychological distress in all models except the IES-Intrusions model. Intrusive thoughts, as discussed above, may take the form of recurrent memories, dreams, or flashbacks about the traumatic event, and may be functional. The intrusive thoughts experienced by breast cancer patients may help to modify the memory network, leading to better psychological adjustment. Breast cancer survivors high in EI who experience intrusive thoughts may not find them distressing, as they are better able to understand the feelings and improve the moods associated with these thoughts.

Attention to mood was a significant predictor in only the IES-Intrusions model, accounting for 2.5% of the unique variance. Simply attending to feelings may not change mood or affect. Individuals may experience feelings with little or no cognitive processing (Zajonc, 1980), regardless of whether attention is focused on them. Feelings about breast cancer may be both confusing and overwhelming, especially if the individual has difficulty understanding and managing them. Paying attention to feelings does not appear to indicate better adjustment in breast cancer survivors, and may increase distress if the individual is poor in clarifying feelings and repairing negative mood states.

Clarity of mood was a significant predictor in all the models except IES-Intrusions. Clarity of mood, as operationalized by the TMMS scale, represents the ability to distinguish among, and understand feelings. Women in this study who evidenced higher scores on the Clarity subscale may have a better and clearer understanding of their own feelings, which may lead to better psychological adjustment. Breast cancer patients who know what they are feeling may be able to terminate aversive ruminative processes, while breast cancer patients who do not have a clear understanding of their feelings may engage in prolonged rumination while trying to make sense of their feelings. A greater sense of clarity regarding feelings about a traumatic event such as breast cancer may limit the amount of rumination, allowing the individual to attend to cognitive processing, leading to better coping and adjustment.

Mood repair was a significant predictor in the IES-Intrusions model, and in the HADS-Depression and Anxiety models. Mood repair represents the ability to repair unpleasant moods or maintain pleasant ones in self and in others. Breast cancer patients in this study who actively engaged in managing and regulating their moods, and the moods of those around them, appeared

to be more successful at cognitive processing of breast cancer related thoughts and feelings. People who are low in EI and thus poor at managing their own moods may become more distressed over time because they cannot control their negative emotions.

This study also tested for possible interactions of EI with Social Support and EI with Social Constraints. Low social support and high social constraints were thought to predict higher levels of psychological distress, but participants with high EI may be able to compensate for poor social environment. Results show that only the EI with Social Support interaction when regressed on the IES-Avoidance score was significant (see Figure 1). This interaction demonstrates that participants who were low in social support and reported low EI were the most distressed, while there was little difference on distress levels between participants with low or high social support when they also reported high EI. Emotional intelligence, in this case, may act as a buffer for low social support regarding avoidant behavior associated with breast cancer diagnosis and treatment.

Overall, these results indicate that women who scored high on EI reported lower psychological distress, in support of the hypothesis regarding EI. Previous research has demonstrated that individuals high in EI are more open to both positive and negative aspects of internal experiences, are better able to label them and to communicate them to others (Mayer & Salovey, 1993). Successful adaptation to a traumatic experience such as breast cancer diagnosis or treatment would depend, in part, on the capacity to attend to, discriminate among, and regulate feelings. Individuals low in EI, who are unable to connect their thoughts to specific emotions may appear irrational and demanding, which may increase any current social constraints they are experiencing. In addition, low EI individuals may have more difficulty processing intrusive thoughts related to trauma, as successful processing of intrusive thoughts may depend on skills related to understanding and modifying feelings, leading to modification of the memory network. Breast cancer survivors who are more able to recognize and manage their own emotions may have more success in cognitive and emotional processing of breast cancer related thoughts and feelings, leading to better psychological adjustment.

The EI construct is in its infancy as an area of research in psychology. The majority of work on EI has investigated validity of the construct, from establishing its existence as a separate form of intelligence (Derksen, Kramer, & Katzko, 2002) to testing the external validity of EI, distinguishing it from empathy, positive affect, and life satisfaction (Ciarrochi, Chan, & Caputi,

2000). Other studies have investigated how EI contributes to marital satisfaction (Fitness, 2001), successful education (Elias, Hunter, & Kress, 2001), and career development (Caruso & Wolfe, 2001). Although there are no published empirical studies investigating EI and how this characteristic may affect adjustment to trauma, the concepts of having a clear understanding of feelings and actively engaging in mood repair logically augment the model of social cognitive adaptation to trauma developed by Lepore (Lepore et al., 1996; Lepore, 1998). The data from the present study indicate that understanding feelings and engaging in mood repair are associated with better psychological adjustment after breast cancer diagnosis and treatment.

This construct may also be applicable with individuals experiencing minor psychopathology. The occurrence of events that typically result in feelings of depression or anxiety, such as losing a job or marital stress, may be handled better by people who are more emotionally intelligent in that they are better able to understand the feelings and emotions surrounding the event and are better able to actively engage in mood repair, improving their mood state. Thus, individuals who are more emotionally intelligent may not experience feelings of depression or anxiety as intensely or of as long a duration as individuals who are not as emotionally intelligent, when experiencing similar life affecting events.

Data Collection via the Internet

This study demonstrates the viability of Internet-based behavioral research. The ability to target a specific population was successfully tested, and the on-line breast cancer support group members showed sufficient interest in the study, completing 211 usable records in 33 days. The web-site received 2,086 visitors during the 33 days of data collection, giving an accrual rate of 11.6%. Data collection via the Internet raises a number of concerns that include data quality, data validity, and generalizability of results. The outcome of this study addresses these concerns, and each will be discussed below.

Data quality.

The web site received 243 records over the 33 day collection period. Although the independence of each submission cannot be guaranteed, each record appeared to be distinct. The possibility of multiple submissions was checked by comparing demographics and the date/time of submission. In addition, demographic data review also screened for possible faulty or 'garbage' data, where a respondent randomly responded to the questions. No records were found to meet either of these concerns. Data problems such as these are more likely in an Internet

study that is open to the public and is made available to search engines (Buchanan, 2000). The target population in this study only had access to the site via breast cancer support group web pages.

There were 32 (13%) records that were incomplete in that they were missing at least one whole questionnaire within the overall survey. There are three possibilities as to why this might have occurred. First, the respondents may have decided not to complete that particular questionnaire once they read the instructions, perhaps finding the questions too distressing. Second, the web-survey may have been too long for some of the respondents, and they may have quit before finishing. Finally, incomplete records may result from a technical issue in that the web server may have incorrectly loaded the page for a specific questionnaire. The respondent may then have inadvertently been forwarded to the next survey page. This web-survey was set up to capture the data from each individual survey as it was completed, ensuring that partially completed records would be saved to the database. None of the incomplete records left the last questionnaire blank (the TMMS), indicating that the length of the web-survey was not an issue. The final reason is more likely after reviewing the data from the incomplete records. There were two questionnaires that were left blank by the majority of the incomplete responders; the HADS (29 missing records), and the SCS (27 missing records). In addition, most of the incomplete records (n=22, 69% of incomplete records) were submitted over one three day period. There may have been a small number of respondents who chose not to complete a particular questionnaire, but most the missing records were likely due to a server error. This kind of problem is inherent in Internet research, and to avoid it the researcher must try to use a web hosting service that is known to be reliable, allowing multiple users into the site simultaneously without encountering problems.

Internal validity of results.

Two methods have been used for assessing internal validity of Internet based research. To establish convergent validity, Internet based study results are compared with results from a traditionally run laboratory based study. This method has been used to successfully establish the convergent validity of Internet research in a number of areas (see Buchanan & Smith, 1999; and Krantz et al., 1997). The present study assessed a population of breast cancer survivors in a number of areas that have been investigated in previous traditional survey research. These areas

include social support, social constraints, depressive symptomatology, levels of anxiety, and distress associated with breast cancer diagnosis and treatment.

Social support scores in this study, as measured by the DUKE-SSQ, had a mean of 32.4 (SD=6.5). This score was very similar to the DUKE-SSQ score obtained from a sample of 160 women with stage I or II breast cancer (M = 33.2, SD = 6.0). These patients were recruited directly from cancer centers in a major metropolitan area (Green et al, 2000). Social constraint scores in this study, as measured by the SCS, had a mean of 31.1 (SD=10.9). This score was higher than the social constraints score obtained from a sample of 70 women with stage I-III breast cancer (M=26.6, SD=11.0) recruited from the University of Kentucky Comprehensive Breast Care Center (Cordova, 1999). This difference may indicate that women who pursue support via Internet-based groups may experience more social constraints.

A score of 8 or more on the anxiety or depression subscales of the HADS has shown to be optimal in detecting anxiety and depressive disorders in cancer patients (Carroll et al., 1993). On average, women scored well below this cut-off on the depression subscale (M = 3.9, SD = 3.5), but only slightly below this cut-off on the anxiety subscale (M = 7.3, SD = 3.7). Specifically, 84.3% of the sample scored below 8 on the HADS depression subscale, and 55.5% of the sample scored below 8 on the HADS anxiety subscale. Previous research has estimated prevalence of symptoms of anxiety and depression at the level suggestive of clinical diagnosis ranging from 22% - 47% in breast cancer survivors, as measured by a number of different well-established instruments (Kornblith, 1998). The women in the present study reported symptoms of anxiety that appear to be consistent with previous research. The number of women who appeared to meet criteria for a depressive disorder was below that of previous research with breast cancer patients. This result might be due to factors in their environment, such as social support. These women may also have more 'fighting spirit', as shown by their pursuit of support via Internet-based groups. Previous research has demonstrated that greater 'fighting spirit' is associated with better adjustment in women with breast cancer (Classen et al., 1996). Additional research is needed with cancer patients who utilize on-line support groups to determine if there are any fundamental differences in coping styles, compared to cancer patients who have the ability, but choose not to pursue on-line support.

The mean score on intrusive thoughts as measured by the IES, M = 15.6 (SD=8.5), was slightly higher to the score reported for a sample of 80 breast cancer patients assessed at six-

months post diagnosis (M = 14.1, SD = 8.3; Epping-Jordan et al, 1999). The mean score on the avoidance subscale of the IES, M = 13.0 (SD = 7.6) was also higher when compared to the same population (M = 11.0, SD = 7.3; Epping-Jordan et al, 1999). Although the scores between the two samples are comparable, these comparisons should be noted with caution as the sample in the present study were surveyed between 4 and 106 months (M=30.5, SD=23.4) after their initial diagnosis.

The second method of establishing internal validity is to see if the results adhere to theoretically predicted psychological constructs (Krantz & Dalal, 2000). To establish construct validity, study results are examined to determine whether a measure of a theoretical construct works as expected. The present study tested the viability of the social cognitive theory of adaptation to trauma (Lepore et al., 1996; Lepore, 1998) in breast cancer survivors. Previous research utilizing this model has demonstrated the importance of a supportive social environment and low social constraints in fostering cognitive processing and reducing distress in breast cancer patients (Cordova, 1999). The results from the present study indicate that low social constraints are associated with better psychological adjustment, while high social support does not appear to be associated with better psychological adjustment in a sample of breast cancer survivors surveyed via the Internet. Further research is needed utilizing this model to investigate if this result is related to use of Internet support groups.

The present study assessed the level of EI in breast cancer survivors. As discussed previously, this construct is in its infancy as an area of research in psychology. Although the data from the present study indicate that understanding feelings and engaging in mood repair are associated with better psychological adjustment after breast cancer diagnosis and treatment, more research is needed in this area to confidently establish construct validity.

External validity of results.

External validity of study findings are a concern in all empirically based investigations of behavior. This issue is especially true for Internet-based data collection studies due to the low number of published articles using the Internet. Present results cannot determine whether the women in this study are representative of breast cancer survivors in general, but there are several reasons to safely assume that study participants may closely resemble average breast cancer survivors. First, the comparisons between outcomes of standard measures (i.e.: IES, HADS, DUKE-SSQ) show minimal difference between traditional samples of breast cancer survivors

and the Internet sample. Second, demographically, the women in the present study closely resemble several samples of breast cancer patient recruited for research in health care settings (see Cordova, 1999 and Epping-Jordan et al., 1999). Although the current sample reported higher education and income compared to traditional breast cancer studies, participants in this study reflect current demographic trends in Internet user statistics. Current national statistics describe the average Internet user as female, Caucasian, with above average education and income (Neilsen/Netratings, 2002). Finally, the women in this study are geographically diverse coming from 39 different states in the U.S.A., and six different foreign sites. Traditional psychological research recruits participants from usually only one location, which may limit generalizability of outcomes.

Study Limitations

Although this study has an number of strengths, there are limitations that need to be acknowledged. This study is cross sectional, which precludes any definitive conclusions regarding causality. Even though the participants in this study who were high in EI reported less psychological distress, a longitudinal study would be needed to determine any causal relationship between EI and psychological distress in breast cancer survivors. This is also the case for the testing of social constraints and social support within the social-cognitive processing model.

The use of data collected via the Internet is a potential weakness. There are no guarantees that the respondents answered the surveys honestly or that they were even breast cancer survivors. This is an inherent risk when conducting research via the Internet. Targeting specific study populations on support group pages and newsgroups, as was done here, precludes the need to advertise the study using search engines, which may limit possible malicious responses.

A final potential weakness is the conceptualization of the EI construct employed in this study. The EI construct continues to change as work in the area improves. This study used the definition of EI developed by Salovey and Mayer in 1990, which describes EI as being attentive to feelings, being able to understand feelings, and engaging in productive mood repair (Salovey & Mayer, 1990). There have been a number of modifications to this definition since that time, with the most recent emphasizing the cognitive components, framing EI in terms of the potential for intellectual and emotional growth. There are four branches to the latest conceptualization of the EI construct which include: (a) perception, appraisal, and expression of emotion, (b)

emotional facilitation of thinking, (c) understanding, analyzing, and employing emotional knowledge, and (d) reflective regulation of emotions to further emotional and intellectual growth (Mayer & Salovey, 1997). These researchers developed a performance measure, the Multifactor Emotional Intelligence Scale (MEIS), to assess these four major components. Additional studies in the cancer area developing the inclusion of EI in the social-cognitive processing model should attempt to use performance measures of EI, to capture the most recent conceptualization of the EI construct.

Recommendations for Future Research

These finding suggest several directions for future study. First, given that empirical investigation of EI in health psychology is in its infancy, it will be important to identify better measures and correlates of this construct. Alternative approaches to measuring EI are observer ratings or performance tests. Previous research with EI has demonstrated that performance type measures tend to be more related to traditional intelligence measures, establishing that EI is a form of intelligence (Ciarrochi et al., 2000). Future traditional studies of cancer patients in medical settings could employ both observer ratings and performance measures of EI, while future studies conducted via the Internet could possibly employ performance measures of EI.

Second, further development of how EI complements the social-cognitive processing model is needed. This study investigated how the social cognitive processing model and EI were associated with better psychological adjustment in breast cancer survivors. Additional studies with this population, both Internet-based and traditionally recruited, are needed to determine if these associations are consistent and not characteristics explicit to the participants in this study.

Third, additional work is needed to establish the validity of using the Internet in health-related behavioral research. Although the number of Internet studies continues to grow, there are still very few studies investigating issues in health psychology.

One approach researchers have used to establish convergent validity is to conduct Internet-based and traditional experiments concurrently with identical measures. This method is quite possible in major cancer treatment centers, where there is a large pool of potential study participants.

Finally, future studies utilizing the Internet should adopt more challenging research methods than cross-sectional surveys. A particularly interesting direction for Internet research would be to conduct a longitudinal study via the Internet. This may be accomplished by simply requesting the respondent's email address when completing the first assessment. Additional

assessments may then be completed by contacting the participant via email with a link to the web-survey page. Future Internet studies should also foster innovation in data portrayal and collection techniques, such as displaying video clips of personal interactions, perhaps between a patient and a health-care provider, and then soliciting respondent perceptions of the clip shown.

In Conclusion

The results of the present study support the view that psychological distress associated with the experience of breast cancer diagnosis and treatment may be related, in part, to psychosocial factors. Findings support the hypotheses that lower social constraints and high emotional intelligence are both associated with lower levels of psychological distress. These results lend further support for the social cognitive processing model in adjustment to traumatic experience. The inclusion of the dispositional characteristics associated with EI may broaden this model, and foster additional research.

The use of the Internet in behavioral research was also tested in this study. The results indicate that it is possible to successfully target a specific population, present a web-site that is appealing to potential subjects, and collect useable data from a geographically diverse sample. In addition, this study demonstrates the advantage of recruiting a large number of research participants in a brief period, which increases study power. These data demonstrate that Internet based data collection is a potentially useful research method in psychological research, and in health-psychology in particular.

Appendix A

Tables

Table 1

Clinical information for respondents (n=190).

| Clinical Variable | N | Percent |
|---|---|---|
| Time Since Diagnosis | | |
| 0 - 12 months | 51 | 26.8 |
| 12 - 24 months | 42 | 22.1 |
| 24 – 60 months | 70 | 36.8 |
| > 60 months | 27 | 14.2 |
| Stage of Disease | | |
| 0 | 13 | 6.8 |
| 1 | 61 | 32.1 |
| 2 | 93 | 48.9 |
| 3 | 20 | 10.5 |
| 4 | 3 | 1.6 |
| Type of Surgery | | |
| Lumpectomy | 82 | 43.2 |
| Mastectomy | 84 | 44.2 |
| Lumpectomy & Mastectomy | 24 | 12.6 |
| Type of Adjuvant Treatment | | |
| Chemotherapy | 45 | 23.7 |
| Radiation | 27 | 14.2 |
| Chemotherapy & Radiation | 101 | 53.2 |
| None | 17 | 8.9 |
| Treatment Complete | | |
| Yes | 130 | 68.4 |
| No | 45 | 23.7 |
| Missing | 15 | 7.9 |

Table 2

Demographic information for respondents (n=190).

| Characteristic | N | Percent |
|---|---|---|
| Marital Status | | |
| Married/Cohabitating | 147 | 77.4 |
| Single/Divorced/Separated/Widowed | 43 | 22.6 |
| Ethnic Affiliation | | |
| Caucasian | 174 | 91.6 |
| African-American | 2 | 1.1 |
| Asian | 2 | 1.1 |
| Latino/Hispanic | 1 | .5 |
| Native American | 1 | .5 |
| Other | 8 | 4.2 |
| Missing | 2 | 1.1 |
| Education | | |
| ≤ 12 years | 46 | 24.2 |
| > 12 years and ≤ 16 years | 82 | 43.2 |
| > 16 years | 62 | 32.6 |
| Job Status | | |
| Full time employment | 98 | 51.6 |
| Part time employment | 38 | 20.0 |
| Homemaker | 19 | 10.0 |
| Retired | 13 | 6.8 |
| Unemployed | 6 | 3.1 |
| Disabled | 13 | 6.8 |
| Missing | 3 | 1.6 |
| Annual Household Income | | |
| <$20K | 9 | 4.7 |
| $20K-$40K | 49 | 25.8 |
| $41K-$60K | 40 | 21.1 |
| $61K-$80K | 24 | 12.6 |
| >$80K | 61 | 32.1 |
| Missing | 7 | 3.7 |
| Geographic Location | | |
| United States | 160 | 84.2 |
| Other | 27 | 14.2 |

Table 3

Descriptive statistics for study measures (n=190).

| Measure | M | SD | Obtained Range | Possible Range | Cronbach's α |
|---|---|---|---|---|---|
| DUKE-SSQ | 32.4 | 6.5 | 8 - 40 | 8 - 40 | .88 |
| SCS | 31.3 | 10.9 | 15 – 59 | 15 - 60 | .95 |
| IES-Total | 28.6 | 13.7 | 1 - 63 | 0 - 75 | .86 |
| IES-Intrusions | 15.6 | 8.5 | 1 – 35 | 0 - 35 | .88 |
| IES-Avoidance | 13.0 | 7.6 | 0 – 32 | 0 – 40 | .75 |
| HADS-Depression | 3.9 | 3.5 | 0 – 17 | 0 - 21 | .83 |
| HADS-Anxiety | 7.3 | 3.7 | 0 – 19 | 0 - 21 | .84 |
| TMMS-Total | 118.8 | 14.4 | 76 – 148 | 30 – 150 | .88 |
| TMMS-Attention | 52.4 | 7.1 | 26 – 65 | 13 – 65 | .83 |
| TMMS-Clarity | 42.8 | 7.7 | 22 – 55 | 11 – 55 | .87 |
| TMMS-Repair | 23.6 | 4.6 | 8 - 30 | 6 - 30 | .82 |

Note. DUKE-SSQ=Duke-UNC Functional Social Support Questionnaire. SCS=Social Constraints Scale. IES=Impact of Events Scale. HADS=Hospital Anxiety and Depression Scale. TMMS=Trait Meta-Mood Scale.

Table 4

Intercorrelations among clinical variables, demographic variables, predictor, and outcome variables (n=190)

| | Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Age | 1.0 | | | | | | | | | | | | | | |
| 2. | Marital status | .18* | 1.0 | | | | | | | | | | | | | |
| 3. | Education | .13 | -.01 | 1.0 | | | | | | | | | | | | |
| 4. | Stage | -.08 | -.06 | .02 | 1.0 | | | | | | | | | | | |
| 5. | Type of treatment | -.19* | .00 | -.01 | .47** | 1.0 | | | | | | | | | | |
| 6. | Type of surgery | .06 | -.07 | -.05 | .22** | -.03 | 1.0 | | | | | | | | | |
| 7. | Time since diagnosis | .37** | .22** | -.02 | .05 | -.07 | .13 | 1.0 | | | | | | | | |
| 8. | DUKE-SSQ | .08 | .21** | .08 | -.08 | .07 | .06 | .03 | 1.0 | | | | | | | |
| 9. | SCS | -.16* | -.12 | -.13 | .04 | -.01 | -.05 | -.03 | -.51** | 1.0 | | | | | | |
| 10. | TMMS-total | .07 | -.06 | .09 | .02 | -.03 | .03 | .02 | .17* | -.15* | 1.0 | | | | | |
| 11. | Attention | -.04 | -.08 | .05 | .03 | -.07 | .03 | .09 | .02 | .09 | .76** | 1.0 | | | | |

| | Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12. | Clarity | .14* | -.05 | .11 | .03 | .01 | .06 | .02 | .17* | -.20** | .80** | .35** | 1.0 | | | |
| 13. | Repair | .03 | .03 | .03 | -.01 | -.01 | -.06 | -.10 | .23** | -.26** | .59** | .25** | .28** | 1.0 | | |
| 14. | IES-total | -.18* | -.01 | -.19* | .11 | .08 | -.03 | -.18* | -.20** | .45** | -.31** | -.07 | -.36** | -.26** | 1.0 | |
| 15. | HADS-dep | -.25** | -.11 | -.15* | .17* | .04 | .11 | -.21** | -.40** | .42** | -.35** | -.08 | -.34** | -.42** | .48** | 1.0 |
| 16. | HADS-anx | -.19** | -.03 | -.13 | .05 | .07 | .04 | -.11 | -.25** | .43** | -.35** | -.04 | -.35** | -.44** | .63** | .59** |

Note. DUKE-SSQ=Duke-UNC Functional Social Support Questionnaire. SCS=Social Constraints Scale. IES=Impact of Events Scale. HADS=Hospital Anxiety and Depression Scale. TMMS=Trait Meta-Mood Scale.
* $p<.05$, ** $p<.01$.

Table 5

Intercorrelations of major independent variables with dependent variables (n=190).

| Measure | HADS-Depression | HADS-Anxiety | IES-Intrusions | IES-Avoidance | IES-Total |
|---|---|---|---|---|---|
| TMMS-Total | -.35** | -.35** | -.13 | -.42** | -.31** |
| TMMS-Attention | -.08 | -.04 | .10 | -.24** | -.07 |
| TMMS-Clarity | -.34** | -.35** | -.19** | -.44** | -.37** |
| TMMS-Repair | -.42** | -.44** | -.24** | -.19* | -.25** |
| DUKE-SSQ | -.40** | -.25** | -.17* | -.17* | -.19** |
| SCS | .42** | .43** | .43** | .32** | .45** |
| Age | -.25** | -.19** | -.22** | -.07 | -.20** |
| Education | -.13 | -.10 | -.10 | -.12 | -.13 |
| Time since diagnosis (in months) | -.21** | -.11 | -.17* | -.13 | -.18* |

* p<.05.
** p<.01.
Note. Table shows Pearson Product Moment Correlations.
Note. TMMS=Trait Meta-Mood Scale. DUKE-SSQ=Duke-UNC Functional Social Support Questionnaire. SCS=Social Constraints Scale.

Table 6

Hierarchical Regression Analysis of Change in HADS scores (n = 190).

| | HADS Depression | | | HADS Anxiety | | |
|---|---|---|---|---|---|---|
| Variable/Step | $R^2$ change | Beta[a] | $sr^2$ | $R^2$ change | Beta[a] | $sr^2$ |
| **Step 1** | .08** | | | .05* | | |
| Age | | -.11 | .010 | | -.09 | .006 |
| Marital status[b] | | .02 | .000 | | .03 | .001 |
| Education | | -.06 | .004 | | -.04 | .001 |
| **Step 2** | .06* | | | .01 | | |
| Stage | | .15* | .015 | | .00 | .000 |
| Type of adjuvant treatment[c] | | -.06 | .002 | | .04 | .001 |
| Type of surgery[d] | | .13* | .015 | | .08 | .006 |
| Time since diagnosis | | -.18** | .027 | | -.07 | .004 |
| **Step 3** | .25*** | | | .24*** | | |
| DUKE-SSQ | | -.21** | .029 | | -.02 | .000 |
| SCS | | .25** | .043 | | .36*** | .094 |
| TMMS-Total | | -.27*** | .070 | | -.28*** | .073 |
| Full Model Statistics | | | | | | |
| Multiple R | .626 | | | .537 | | |
| Multiple R2 | .392 | | | .289 | | |
| F-statistic[e] | 11.55*** | | | 7.26*** | | |

[a]Standardized beta coefficient for full, 10 variable model.
[b]Partnered (1) vs. not partnered (0).
[c]None (0), radiation (1), chemotherapy (2), radiation and chemotherapy (3).
[d]Lumpectomy (1) vs. mastectomy (2).
[e]df = 10,179.
* p<.05, ** p<.01, *** p<.001.

Table 7

Hierarchical Regression Analysis of Change in IES scores (n = 190).

| | IES Total Score | | | IES Intrusions | | | IES Total Avoidance | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable/Step | $R^2$ change | Beta[a] | $sr^2$ | $R^2$ change | Beta[a] | $sr^2$ | $R^2$ change | Beta[a] | $sr^2$ |
| **Step 1** | .06* | | | .06* | | | .03 | | |
| Age | | -.02 | .000 | | -.09 | .006 | | .06 | .003 |
| Marital status[b] | | .05 | .003 | | .08 | .005 | | .01 | .000 |
| Education | | -.12 | .013 | | -.09 | .008 | | -.11 | .011 |
| **Step 2** | .03 | | | .03 | | | .02 | | |
| Stage | | .12 | .010 | | .12 | .009 | | .08 | .004 |
| Type of adjuvant treatment[c] | | .00 | .000 | | .02 | .000 | | -.01 | .000 |
| Type of surgery[d] | | -.01 | .000 | | .01 | .001 | | -.05 | .002 |
| Time since diagnosis | | -.17* | .024 | | -.15* | .019 | | -.14 | .015 |
| **Step 3** | .23*** | | | .17*** | | | .23*** | | |
| DUKE-SSQ | | .08 | .005 | | .08 | .005 | | .06 | .002 |
| SCS | | .44*** | .135 | | .44*** | .140 | | .29*** | .058 |
| TMMS-Total | | -.24*** | .056 | | .06 | .003 | | -.37*** | .131 |
| Full Model Statistics | | | | | | | | | |
| Multiple R | .567 | | | .510 | | | .523 | | |
| Multiple R2 | .322 | | | .260 | | | .274 | | |
| F-statistic[e] | 8.50*** | | | 6.29*** | | | 6.74*** | | |

[a]Standardized beta coefficient for full, 11 variable model.
[b]Partnered (1) vs. not partnered (0).
[c]None (0), radiation (1), chemotherapy (2), radiation and chemotherapy (3).
[d]Lumpectomy (1) vs. mastectomy (2).
[e]df = 10,179.
* p<.05, ** p<.01, *** p<.001.

Table 8

Best Fit Regression Model Analysis of Change in HADS scores (n = 190).

| Variable | HADS Depression Beta[a] | HADS Anxiety Beta[a] | IES Total Score Beta[a] | IES Intrusions Beta[a] | IES Avoidance Beta[a] |
|---|---|---|---|---|---|
| Age | | | | | |
| Marital status[b] | | | | | |
| Education | | | | | |
| Stage | .13* | | | | |
| Type of adjuvant treatment[c] | | | | | |
| Type of surgery[d] | .14* | | | | |
| Time since diagnosis | -.21*** | | -.16* | -.16* | |
| DUKE-SSQ | -.21** | | | | |
| SCS | .27*** | .38*** | .41*** | .43*** | .27*** |
| TMMS-Total | -.28*** | -.29*** | -.25*** | | -.38*** |
| Best Fit Model Statistics | | | | | |
| Multiple R | .631 | .513 | .537 | .460 | .492 |
| Multiple R2 | .376 | .263 | .288 | .212 | .242 |
| F-statistic | 18.36*** | 33.33*** | 25.09*** | 25.15*** | 29.90*** |

[a]Standardized beta coefficient for best fit model.
[b]Partnered (1) vs. not partnered (0).
[c]None (0), radiation (1), chemotherapy (2), radiation and chemotherapy (3).
[d]Lumpectomy (1) vs. mastectomy (2).
* p<.05, ** p<.01, *** p<.001.

Table 9

Hierarchical Regression Analysis of Change in HADS scores with TMMS subscales (n = 190).

| | HADS Depression | | | HADS Anxiety | | |
|---|---|---|---|---|---|---|
| Variable/Step | $R^2$ change | Beta[a] | $sr^2$ | $R^2$ change | Beta[a] | $sr^2$ |
| **Step 1** | .08** | | | .05* | | |
| Age | | -.08 | .005 | | -.05 | .002 |
| Marital status[b] | | .03 | .001 | | .05 | .002 |
| Education | | -.08 | .006 | | -.06 | .003 |
| **Step 2** | .06* | | | .01 | | |
| Stage | | .15* | .015 | | -.01 | .000 |
| Type of adjuvant treatment[c] | | -.04 | .001 | | .06 | .003 |
| Type of surgery[d] | | .12 | .012 | | .07 | .004 |
| Time since diagnosis | | -.23*** | .043 | | -.13 | .014 |
| **Step 3** | .31*** | | | .32*** | | |
| DUKE-SSQ | | -.20** | .026 | | -.01 | .000 |
| SCS | | .17* | .019 | | .27*** | .048 |
| TMMS-Attention | | .06 | .003 | | .12 | .010 |
| TMMS-Clarity | | -.19** | .027 | | -.22** | .038 |
| TMMS-Repair | | -.31*** | .076 | | -.34*** | .093 |
| Full Model Statistics | | | | | | |
| Multiple R | .670 | | | .610 | | |
| Multiple R2 | .449 | | | .372 | | |
| F-statistic[e] | 12.00*** | | | 8.73*** | | |

[a]Standardized beta coefficient for full, 12 variable model.
[b]Partnered (1) vs. not partnered (0).
[c]None (0), radiation (1), chemotherapy (2), radiation and chemotherapy (3).
[d]Lumpectomy (1) vs. mastectomy (2).
[e]df = 12,177.
* p<.05, ** p<.01, *** p<.001.

Table 10

Hierarchical Regression Analysis of Change in IES scores with TMMS subscales (n = 190).

| | IES Total Score | | | IES Intrusions | | | IES Total Avoidance | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable/Step | $R^2$ change | Beta[a] | $sr^2$ | $R^2$ change | Beta[a] | $sr^2$ | $R^2$ change | Beta[a] | $sr^2$ |
| **Step 1** | .06* | | | .06* | | | .03 | | |
| Age | | .02 | .000 | | -.05 | .002 | | .09 | .005 |
| Marital status[b] | | .06 | .003 | | .09 | .007 | | .00 | .000 |
| Education | | .06 | .014 | | -.10 | .010 | | -.10 | .010 |
| **Step 2** | .03 | | | .03 | | | .02 | | |
| Stage | | .11 | .008 | | .11 | .009 | | .07 | .003 |
| Type of treatment[c] | | .02 | .000 | | .03 | .001 | | .00 | .000 |
| Type of surgery[d] | | -.01 | .000 | | .02 | .000 | | -.03 | .001 |
| Time since diagnosis | | -.20** | .032 | | -.20** | .032 | | -.14 | .015 |
| **Step 3** | .26*** | | | .22*** | | | .25*** | | |
| DUKE-SSQ | | .08 | .005 | | .09 | .005 | | .05 | .002 |
| SCS | | .38*** | .097 | | .37*** | .089 | | .28*** | .051 |
| TMMS | | | | | | | | | |
| Attention | | .05 | .002 | | .18* | .025 | | -.12 | .010 |
| Clarity | | -.26*** | .052 | | -.11 | .010 | | -.35*** | .092 |
| Repair | | -.13 | .014 | | -.19** | .030 | | -.02 | .000 |
| Full Model Statistics | | | | | | | | | |
| Multiple R | .591 | | | .556 | | | .545 | | |
| Multiple R2 | .350 | | | .309 | | | .297 | | |
| F-statistic[e] | 7.93*** | | | 6.60*** | | | 6.23*** | | |

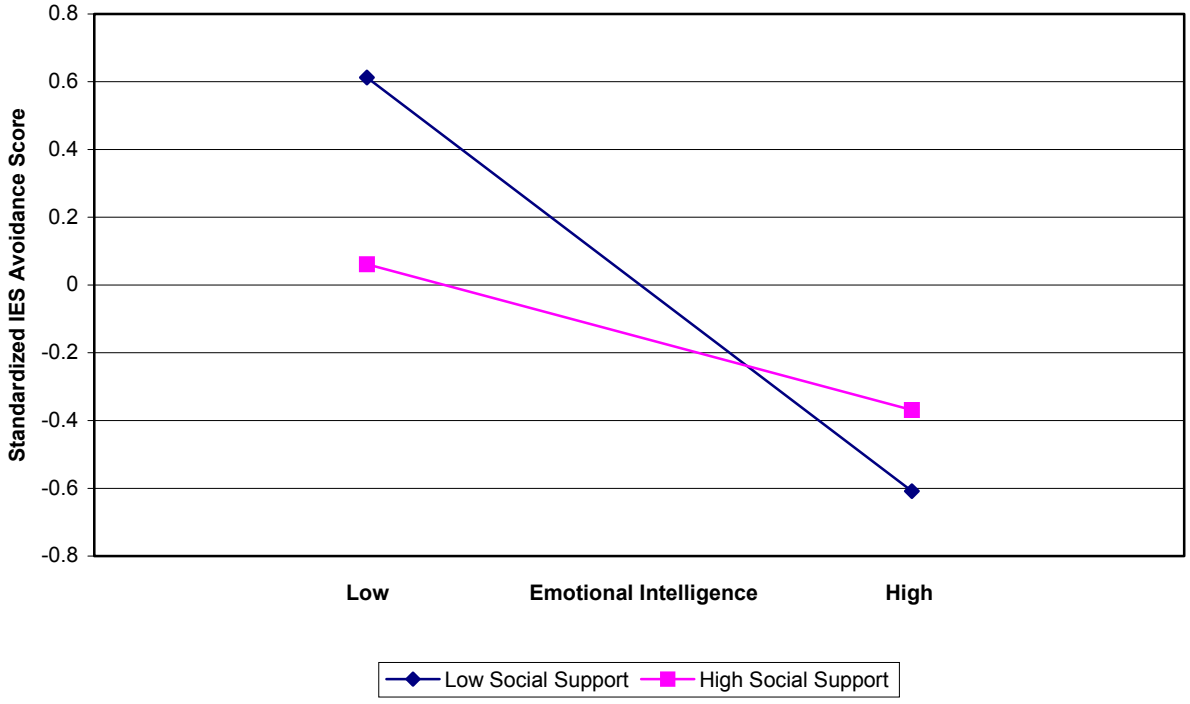
[a]Standardized beta coefficient for full, 12 variable model.
[b]Partnered (1) vs. not partnered (0).
[c]None (0), radiation (1), chemotherapy (2), radiation and chemotherapy (3).
[d]Lumpectomy (1) vs. mastectomy (2).
[e]df = 12,177.
* p<.05, ** p<.01, *** p<.001.

Appendix B

Figures

Figure 1

Effects of Social Support and Emotional Intelligence on IES Avoidance



Appendix C

Measures

IES

Below is a list of comments made by people after stressful life events. Please read each item, and then indicate how frequently these comments were true for you during the past 7 days with respect to your experience with breast cancer.

| | | Not at all | Rarely | Sometimes | Often |
|---|---|---|---|---|---|
| 1. | I thought about it when I didn't mean to. | 1 | 2 | 3 | 4 |
| 2. | I avoided letting myself get upset when I thought about it or was reminded of it. | 1 | 2 | 3 | 4 |
| 3. | I tried to remove it from memory. | 1 | 2 | 3 | 4 |
| 4. | I had trouble falling asleep or staying asleep because of pictures or thoughts about it that came into my mind. | 1 | 2 | 3 | 4 |
| 5. | I had waves of strong feelings about it. | 1 | 2 | 3 | 4 |
| 6. | I had dreams about it. | 1 | 2 | 3 | 4 |
| 7. | I stayed away from reminders of it. | 1 | 2 | 3 | 4 |
| 8. | I felt as if it hadn't happened or wasn't real. | 1 | 2 | 3 | 4 |
| 9. | I tried not to talk about it. | 1 | 2 | 3 | 4 |
| 10. | Pictures about it popped into my mind. | 1 | 2 | 3 | 4 |
| 11. | Other things kept making me think about it. | 1 | 2 | 3 | 4 |
| 12. | I was aware I still had a lot of feelings about it, but didn't deal with them. | 1 | 2 | 3 | 4 |
| 13. | I tried not to think about it. | 1 | 2 | 3 | 4 |
| 14. | Any reminder brought back feelings about it. | 1 | 2 | 3 | 4 |
| 15. | My feelings about it were kind of numb. | 1 | 2 | 3 | 4 |

SCS

Below is a list of social experiences. For each question, please circle a number of how often you have had that experience in the past month.

| | How often in the past month did your friends or family… | Never | Rarely | Sometimes | Often |
|---|---|---|---|---|---|
| 1. | change the subject when you tried to discuss your experience with cancer? | 1 | 2 | 3 | 4 |
| 2. | not seem to understand your situation? | 1 | 2 | 3 | 4 |
| 3. | avoid you? | 1 | 2 | 3 | 4 |
| 4. | minimize your problems? | 1 | 2 | 3 | 4 |
| 5. | seem to be hiding their feelings? | 1 | 2 | 3 | 4 |
| 6. | act uncomfortable when you talked about your experience with cancer? | 1 | 2 | 3 | 4 |
| 7. | trivialize your problems? | 1 | 2 | 3 | 4 |
| 8. | complain about their own problems when you wanted to share yours? | 1 | 2 | 3 | 4 |
| 9. | act cheerful around you to hide their true feelings or concerns? | 1 | 2 | 3 | 4 |
| 10. | tell you not to worry so much about your health? | 1 | 2 | 3 | 4 |
| 11. | tell you to try not to think about cancer? | 1 | 2 | 3 | 4 |
| 12. | give you the idea that they didn't want to hear about your experience with cancer? | 1 | 2 | 3 | 4 |
| 13. | make you feel as though you had to keep your feelings about your experience with cancer to yourself, because they made them feel uncomfortable? | 1 | 2 | 3 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| 14. | make you feel as though you had to keep your feelings about your experience with cancer to yourself, because they made them feel upset? | 1 | 2 | 3 | 4 |
| 15. | let you down by not showing you as much love and concern as you would have liked? | 1 | 2 | 3 | 4 |

DUKE-SSQ

Below is a list of things that other people do for us or give us that may be helpful or supportive. Please read each statement carefully and indicate an answer that is closest to your situation. Respond to each question by picking a number on the scale from "1" to "5" to tell me how you feel about the amount of support you receive. Answering "1" would mean that you get that type of support "much less than you would like" and answering "5" would mean that you get that type of support "as much as you would like." Answering with numbers 2, 3, and 4 would indicate that you feel somewhere in-between. For example, if asked if you get enough vacation time, answering "4" means that you get "almost" as much vacation time as you would like, but not quite as much as you would like. Answer each item as best you can. There are no right or wrong answers.

| | | Much less than I would like | | | | As much as I would like |
|---|---|---|---|---|---|---|
| 1. | I have people who care about what happens to me. | 1 | 2 | 3 | 4 | 5 |
| 2. | I get love and affection. | 1 | 2 | 3 | 4 | 5 |
| 3. | I get chances to talk to someone about problems at work or with my homework. | 1 | 2 | 3 | 4 | 5 |
| 4. | I get chances to talk to someone I trust about my personal and family problems. | 1 | 2 | 3 | 4 | 5 |
| 5. | I get chances to talk about money matters. | 1 | 2 | 3 | 4 | 5 |
| 6. | I get invitations to go out and do things with other people. | 1 | 2 | 3 | 4 | 5 |
| 7. | I get useful advice about important things in life. | 1 | 2 | 3 | 4 | 5 |
| 8. | I get help when I'm sick in bed. | 1 | 2 | 3 | 4 | 5 |

TMMS

Please read each statement and decide whether or not you agree with it. Please indicate how much you AGREE OR DISAGREE with each of the following statements. To do so, simply circle a number from 0 to 5 using the scale shown below.

| | | Strongly disagree | Some-what disagree | Neither agree or disagree | Some-what agree | Strongly agree |
|---|---|---|---|---|---|---|
| 1. | I try to think good thoughts no matter how badly I feel. | 1 | 2 | 3 | 4 | 5 |
| 2. | People would be better off if they felt less and thought more. | 1 | 2 | 3 | 4 | 5 |
| 3. | I don't think it's worth paying attention to your emotions or moods. | 1 | 2 | 3 | 4 | 5 |
| 4. | I don't usually care much about what I'm feeling. | 1 | 2 | 3 | 4 | 5 |
| 5. | Sometimes I can't tell what my feelings are. | 1 | 2 | 3 | 4 | 5 |
| 6. | I am rarely confused about how I feel. | 1 | 2 | 3 | 4 | 5 |
| 7. | Feelings give direction to life. | 1 | 2 | 3 | 4 | 5 |
| 8. | Although I am sometimes sad, I have a mostly optimistic outlook. | 1 | 2 | 3 | 4 | 5 |
| 9. | When I am upset I realize that the "good things in life" are illusions. | 1 | 2 | 3 | 4 | 5 |
| 10. | I believe in acting from the heart. | 1 | 2 | 3 | 4 | 5 |
| 11. | I can never tell how I feel. | 1 | 2 | 3 | 4 | 5 |
| 12. | The best way for me to handle my feelings is to experience them to the fullest. | 1 | 2 | 3 | 4 | 5 |
| 13. | When I become upset I remind myself of all the pleasures in life. | 1 | 2 | 3 | 4 | 5 |
| 14. | My belief and opinions always seem to change depending on how I feel. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 15. | I am often aware of my feelings on a matter. | 1 | 2 | 3 | 4 | 5 |
| 16. | I am usually confused about how I feel. | 1 | 2 | 3 | 4 | 5 |
| 17. | One should never be guided by emotions. | 1 | 2 | 3 | 4 | 5 |
| 18. | I never give into my emotions. | 1 | 2 | 3 | 4 | 5 |
| 19. | Although I am sometimes happy, I have a mostly pessimistic outlook. | 1 | 2 | 3 | 4 | 5 |
| 20. | I feel at ease about my emotions. | 1 | 2 | 3 | 4 | 5 |
| 21. | I pay a lot of attention to how I feel. | 1 | 2 | 3 | 4 | 5 |
| 22. | I can't make sense out of my feelings. | 1 | 2 | 3 | 4 | 5 |
| 23. | I don't pay much attention to my feelings. | 1 | 2 | 3 | 4 | 5 |
| 24. | I often think about my feelings. | 1 | 2 | 3 | 4 | 5 |
| 25. | I am usually very clear about my feelings. | 1 | 2 | 3 | 4 | 5 |
| 26. | No matter how badly I feel, I try to think about pleasant things. | 1 | 2 | 3 | 4 | 5 |
| 27. | Feelings are a weakness humans have. | 1 | 2 | 3 | 4 | 5 |
| 28. | I usually know my feelings about a matter. | 1 | 2 | 3 | 4 | 5 |
| 29. | It is usually a waste of time to think about your emotions. | 1 | 2 | 3 | 4 | 5 |
| 30. | I almost always know exactly how I am feeling. | 1 | 2 | 3 | 4 | 5 |

HADS

Read each question below, then mark the number that represents how strongly that statement describes your current feelings.

| | | | | | |
|---|---|---|---|---|---|
| 1. | **I feel tense or 'wound up'** | Most of the time | A lot of the time | From time to time, occasionally | Not at all |
| 2. | **I still enjoy the things I used to enjoy** | Definitely as much | Not quite so much | Only a little | Hardly at all |
| 3. | **I get a sort of frightened feeling as if something awful is about to happen** | Very definitely and quite badly | Yes, but not too badly | A little, but it doesn't worry me | Not at all |
| 4. | **I can laugh and see the funny side of things** | As much as I always could | Not quite so much now | Definitely not so much now | Not at all |
| 5. | **Worrying thoughts go through my mind** | A great deal of the time | A lot of the time | From time to time, but not too often | Only occasionally |
| 6. | **I feel cheerful** | Not at all | Not often | Sometimes | Most of the time |
| 7. | **I can sit at ease and feel relaxed** | Definitely | Usually | Not often | Not at all |
| 8. | **I feel as if I am slowed down** | Nearly all the time | Very often | Sometimes | Not at all |
| 9. | **I get a sort of frightened feeling like 'butterflies' in the stomach** | Not at all | Occasionally | Quite often | Very often |
| 10. | **I have lost interest in my appearance** | Definitely | I don't take as much care as I should | I may not take quite as much care | I take just as much care as ever |
| 11. | **I feel restless as I have to be on the move** | Very much indeed | Quite a lot | Not very much | Not at all |

| | | | | | |
|---|---|---|---|---|---|
| 12. | **I look forward with enjoyment to things** | As much as I ever did | Rather less than I used to | Definitely less than I do | Hardly at all |
| 13 | **I get sudden feelings of panic** | Very often indeed | Quite often | Not very often | Not at all |
| 14. | **I can enjoy a good book or radio or TV program** | Often | Sometimes | Not often | Very seldom |

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**VITA**
**JOHN E. SCHMIDT**
**April 2002**

## BIOGRAPHICAL INFORMATION

Date of Birth: May 25, 1964

Place of Birth: Philadelphia, Pennsylvania

## EDUCATION

| | |
|---|---|
| 7/91 - 5/95 | Widener University<br>Bachelor of Science in Electrical Engineering, May 1995<br>Graduated Magna Cum Laude |

## TEACHING EXPERIENCE

| | |
|---|---|
| 1/00 – 5/00 | Teaching Assistant, University of Kentucky.<br>Laboratory Instructor for Applications of Statistics in Psychology. |
| 8/99 - 12/99 | Teaching Assistant, University of Kentucky.<br>Laboratory Instructor for Introduction to Psychology Course. |

## CLINICAL EXPERIENCE

| | |
|---|---|
| 9/00 - present | Student Therapist, *JGH Psychological Services Center*, Lexington, KY. |
| 6/00 - present | Psychology Intern, *UK Orofacial Pain Center:* Lexington, KY. |

## WORK EXPERIENCE

| | |
|---|---|
| 5/98 - 6/99 | Program Specialist, *Elwyn Incorporated:*<br>**Adult Residential Mental Health Services** |
| 4/96 - 2/98 | Electrical Engineer, *Somat Corporation* |
| 6/95 - 4/96 | Electrical Engineer, *Armstrong World Industries* |
| 6/94 - 3/95 | Cooperative Associate, *SmithKline Beecham Pharmaceuticals* |

| | |
|---|---|
| 8/92 - 6/93 | Cooperative Associate, *Pennsylvania Power and Light Company*<br>Susquehanna Steam Electric Station (Berwick Nuclear Plant) |
| 6/85 - 7/91 | Communications Technician and Work Center Supervisor<br>*United States Navy*<br>USS LaSalle (AGF-3), USS Boulder (LST-1190) |

## RESEARCH EXPERIENCE

| | |
|---|---|
| 6/00 – present | DOD Research Trainee, UK Dept. of Behavioral Science: Lexington, KY. |
| 6/00 - present | Research Assistant, UK Orofacial Pain Center: Lexington, KY. |
| 8/99 - present | Research Assistant, UK Dept. of Psychology: Lexington, KY. |
| 8/98 - 5/99 | Research Assistant, West Chester University Dept. of Psychology: West Chester, PA. |

## SCHOLASTIC HONORS

| | |
|---|---|
| 2000 - 2002 | Predoctoral Traineeship in Psychosocial Breast Cancer Research. |
| 1995 | Elected to Phi Kappa Phi; The National Honor Society. |
| 1995 | Graduated Magna Cum Laude, Widener University. |
| 1995 | Shirley M. Kornfield Undergraduate Award – Widener University. |
| 1994-1995 | President - Tau Beta Pi; The National Engineering Honor Society. |
| 1991-1995 | National Dean's List (all semesters, Widener University). |

## NON-SCHOLASTIC HONORS

| | |
|---|---|
| 1998 | Honorable Discharge - United States Navy. |
| 1991 | Navy Achievement Medal. |
| 1982 | Eagle Scout. |

## PROFESSIONAL AFFILIATIONS

| | |
|---|---|
| 2000 - present | Society of Behavioral Medicine (student affiliate). |
| 2000 - present | APA Division 38 - Health Psychology (student affiliate). |
| 2000 - present | APA Division 12 - Clinical Psychology (student affiliate). |
| 1998 - present | American Psychological Association (student affiliate). |

## REFEREED JOURNAL PUBLICATIONS

Lindroth, J. E., **Schmidt, J. E.**, & Carlson, C. R. (in press). A Comparison Between Masticatory Muscle Pain Patients and Intracapsular Pain Patients on Behavioral and Psychosocial Domains. Journal of Orofacial Pain.

## PUBLISHED ABSTRACTS

**Schmidt, J.E.**, Beacham, A., Bollmer, J.M., Malik, U., Andrykowski, M.A., & Jacobsen, P. (2002). Evaluation of the Diagnostic Interview for Cancer-Related Fatigue (DICRF) in women with breast cancer. [abstract] Annals of Behavioral Medicine, 24 (Suppl.), S172.

**Schmidt, J.E.,** Baer, R., De Leeuw, R., & Carlson, C.R. (2002). Use of the NEO-Five Factor Inventory with orofacial pain patients. [abstract] Annals of Behavioral Medicine, 24 (Suppl.), S005.

Bollmer, J.M., Beacham, A., **Schmidt, J.E.**, Malik, U., Andrykowski, M.A., & Jacobsen, P. (2002). Longitudinal study of fatigue after adjuvant treatment for breast cancer. [abstract] Annals of Behavioral Medicine, 24 (Suppl.), S005.

**Schmidt, J.E.**, Bollmer, J., Blonder, L., & Andrykowski, M.A. (2001). Development of a behavioral approach to assessing emotional expression. [abstract] Annals of Behavioral Medicine, 23 (Suppl.), S173.

Bollmer, J.M., **Schmidt, J.E.**, Blonder, L.X., & Andrykowski, M.A. (2001). Emotional expression in women with breast cancer: A comparative study. [abstract] Annals of Behavioral Medicine, 23 (Suppl.), S078.

## REFEREED PRESENTATIONS

**Schmidt, J.E.**, Beacham, A., Bollmer, J.M., Malik, U., Andrykowski, M.A., & Jacobsen, P. (2002, April). Evaluation of the Diagnostic Interview for Cancer-Related Fatigue (DICRF) in Women with Breast Cancer. Poster presented at the 23rd annual meeting of the Society of Behavioral Medicine, Washington, D.C.

**Schmidt, J.E.,** Baer, R., De Leeuw, R., & Carlson, C.R. (2002, April). Use of the NEO-Five Factor Inventory with Orofacial Pain Patients. Poster presented at the 23rd annual meeting of the Society of Behavioral Medicine, Washington, D.C.

Bollmer, J.M., Beacham, A., **Schmidt, J.E.**, Malik, U., Andrykowski, M.A., & Jacobsen, P. (2002, April). Longitudinal Study of Fatigue after Adjuvant Treatment for Breast Cancer. Poster presented at the 23rd annual meeting of the Society of Behavioral Medicine, Washington, D.C.

**Schmidt, J. E.,** Bollmer, J. M., Blonder, L. X., & Andrykowski, M. A. (2001, March). Development of a Behavioral Approach to Assessing Emotional Expression. Poster presented at the 22nd annual meeting of the Society of Behavioral Medicine, Seattle.

Bollmer, J. M., **Schmidt, J. E.**, Blonder, L. X., & Andrykowski, M. A. (2001, March). Emotional Expression in Women With Breast Cancer: A Comparative Study. Poster presented at the 22nd annual meeting of the Society of Behavioral Medicine, Seattle.

Lindroth, J. E., **Schmidt, J. E.**, & Carlson, C. R. (2001, March). A Comparison Between Masticatory Muscle Pain Patients and Intracapsular Pain Patients on Behavioral and Psychosocial Domains. Poster presented at the Annual Scientific Meeting on Orofacial Pain & Temporomandibular Disorders, Washington, D.C.